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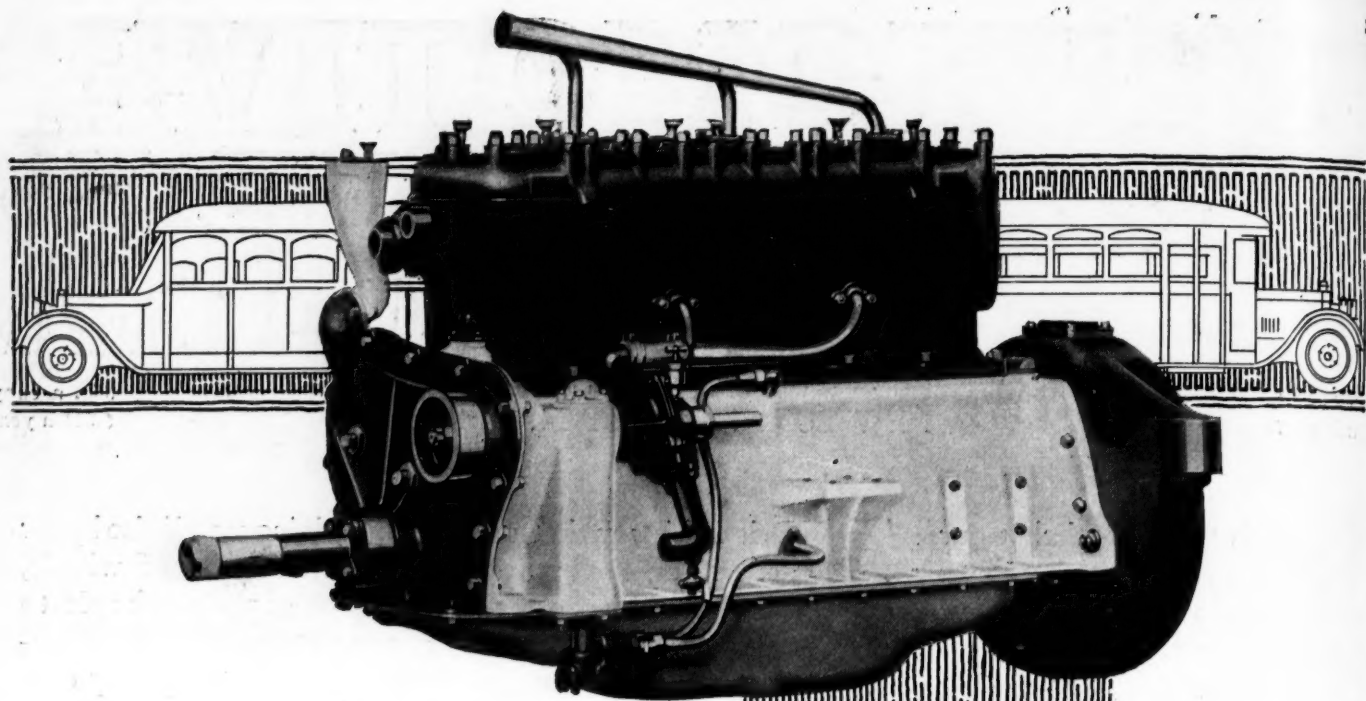
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AUTOMOTIVE INDUSTRIES

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NEW YORK—THURSDAY, AUGUST 14, 1924

No. 7

Compulsory Insurance—What Will the Industry Do About It?

*Laws likely to be proposed in many states this year. Legislation
would affect car sales, accident and insurance rates.*

By D. G. o'Connor

AGITATION for compulsory liability insurance for automotive vehicles has been increasing with almost unprecedented rapidity this year, and with the convening of State legislatures throughout the United States in 1924 this measure is likely to receive more attention than any other automobile legislation which will be proposed.

In five States, Maryland, Massachusetts, New Jersey, New York and Rhode Island, bills were this year introduced to compel automobile owners to carry liability insurance. None of them passed, but the movement has attained such proportions that discussion of this proposed legislation has become a subject of general debate among the vast number of individuals and groups interested in laws governing traffic safety and the use of automobiles.

Manufacturers, owners, drivers, automobile clubs, taxicab and truck owners' associations, committees on traffic and public safety, State investigating committees, legislative, judicial and enforcement bodies—these and many more have had the subject under discussion.

On one thing they universally agree. Compulsory liability insurance would make the irresponsible owner competent to pay for any personal injury or damage he might cause.

Whether that will offer sufficient reason for enacting such legislation or whether all of this agitation will lead to laws which will be constructive in reducing the number of accidents rather than insuring financial responsibility remains to be determined.

A brief summary of the provisions included in the bill introduced in Maryland in three different meas-

ures, all of which failed to pass, may help to clarify one's conception of what such a law would mean. The bill introduced by State Senator G. A. Frick of Maryland and entitled: "An Act to compel the owner of every motor vehicle to give due security for the protection of any person sustaining loss or injury as a result of negligent operation of such motor vehicle, and making the owner liable therefor . . . and for the enforcement of such protection and such liability."

Provisions included required that every owner obtain either insurance or a bond from some reputable company before he could operate his car. Minimum liability, except for vehicles operating for hire, was fixed at \$2,500 for personal injury suffered or sustained by one person, \$5,000 for more than one person, and \$2,500 for property damage or injury. Motor vehicles carrying passengers for hire were to carry bond or insurance to cover a minimum liability of \$10,000 for personal injuries sustained by one or more persons and \$5,000 property damage, or they could put up a corporation bond of \$20,000 as guarantee of payment and satisfaction of judgment.

THE owner was responsible for the car in the hands of any agent, servant or employee, but was not responsible should his car be stolen. And for the purpose of this act the real owner was to be the person in whose name the motor vehicle was registered in the office of the commissioner of motor vehicles regardless of contract, bill of sale or option. Cars owned out of the State causing an accident while operating in Maryland were to be seized by some

police official and impounded.

The one great difficulty which always has existed and which Senator Frick did not take into consideration is how the responsibility for accidents should and could be determined.

Massachusetts, Rhode Island and New Jersey had similar laws introduced, with provisions which differed slightly as to detail, and New York finally passed a law which recently went into effect. This New York law compels taxicabs and trucks operating within the State to be insured against personal injury and property damage.

Contradictory Claims Made

The claims made for and against compulsory liability insurance are distinctly contradictory save for the fact that it would make the irresponsible driver financially responsible.

Advocates claim that it will reduce the number of accidents, while opponents insist that it will increase reckless driving; that the best way to reduce the number of accidents is to enforce strictly the laws already in existence.

Proponents believe that the cost would be kept at a very small amount if undertaken by the State, while those opposed claim that it would be an unbearably heavy burden and that there is no assurance that the premium could or would be kept low.

To go somewhat further into the difficulties and objections, insurance companies claim that even with the preferred risks, which are the only kind they care to or will accept, the expense of operation is so great that it would limit the use of motor vehicles to have such a law; that since the State cannot compel them to carry risks which they consider undesirable, the State would have to furnish insurance or its equivalent; and that this would further increase the cost to each individual who is already carrying or would have to carry this insurance under the proposed law. They claim that their profits are small even on their preferred risks.

Might Limit Low Priced Time Sales

Some of the advocates admit that it might limit the sale of cars on the \$5 a week plan, but that the volume of insurance would be so great that the premium could be fixed at somewhere between \$25 and \$50 per car, which would reduce sales only to a negligible amount. If one may consider the fifteen million and more cars that are registered in this country, or the vast majority of States whose cars number from more than one hundred thousand up to more than a million, the estimated premiums would amount, at \$25 per car, to \$375,000,000, or, at \$50 per car, to \$750,000,000. They claim that such an amount is not unreasonable to ask as assurance for personal injury and property damage responsibility.

Opponents claim that it would make the careful and responsible pay for the damage caused by the irresponsible and reckless.

Proponents claim that this is already true. The careful and responsible are the people who maintain our charities, and in our present economical system both the injured and the dependents of injured are

cared for in case of need by either individual or public charities, which are supported by individuals or indirectly by means of taxes.

One man well known in insurance work said that "It will not guarantee relief for accidents caused by automobiles registered outside the State having no compulsory insurance law, but will discriminate in their favor as against automobiles owned by citizens of the State."

In reply to this, a man in favor of compulsory liability insurance claims that one of the provisions included in Maryland's proposed law would be equitable. This provision calls for seizure and impounding of the car from outside the State, should it cause an accident, until such time as the suit was settled, or the owner should put up a bond for the amount required by the State in which the accident occurred.

Would Work to Detriment of Some Citizens

Insurance companies claim that the State's being in the insurance business, as it would be, would work to the detriment of citizens engaged in that business.

Proponents claim that the same charge was made against the Workmen's Compensation Laws and Fund.

Insurance companies further claim that if the State should go into the insurance business they would be handicapped by a lack of detailed statistics and facilities for gathering and compiling them.

Advocates say that no single insurance company has complete figures now and that such cooperation as they are willing to give each other never has resulted in their acquiring anything like accurate data for even one State from which to work.

Insurance companies claim that compulsory insurance would stifle competition in the insurance field.

Advocates of the measure state that the premiums are fixed by a State insurance board or committee and that it would not stifle competition.

A man prominent in the Workmen's Compensation Fund of New York State expresses an opinion that a plan similar to the one they operate under which this fund operates could be worked out for compulsory liability insurance. He says that the premiums charged to Workmen's Compensation Fund clients began on a scale 15 per cent below that fixed by the State Insurance Board and that in addition the fund has paid dividends to all its clients on a pro rata basis from one year after the date on which the State fund began to operate; and that for the last four years, which included 1920, dividends from profits have been fixed at 20 per cent.

Lack of Discrimination

Edson S. Lott, president, U. S. Casualty Co., believes that with the State in the insurance business, insurance would be issued with just as great a lack of discrimination as is now used in issuing licenses and that "If compulsory insurance should come and result in over-emphasizing compensation and distracting thought and effort from accident prevention, it would be a long step backward."

A man who knows psychology very well claims that recklessness is an inherent quality in a certain proportion of the population of every country in the world,

Pros and Cons of Compulsory Automobile Liability Insurance

For—

Reduce the number of accidents because carefulness would be increased.

Cost comparatively low—\$25 to \$50 per year—if undertaken by the State.

Decrease cost for people already carrying it, due to increased volume of business to be underwritten.

Sales of low-priced cars on \$5 a week and similar plans will be reduced only negligibly, higher priced cars not at all, for financing will include insurance as well as the car itself.

Responsible people now pay for accidents through contributions to charities and through tax-supported institutions.

Cars from out of the State could be bonded or impounded if involved in an accident.

Greater volume of business would increase policies of those citizens engaged in selling insurance.

Insurance companies as well as States lack complete data and statistics on which to base premiums.

Competition for insurance increased by greater sales opportunities.

Compensation would be assured whether insurance were issued with discrimination or not.

Compensation is simple equity, the payment for damage or injury one might have caused.

Should the State enter the insurance field it would be able to reduce costs, as it has in the Workmen's Compensation Act.

Some interstate plan could be worked out to avoid the State becoming involved in lawsuits brought about by accidents in other States.

People unable to pay for accidents they might cause should be restricted in the operation of cars involving such a risk.

Agreed—that it would safeguard the interests of people on streets and highways, whether on foot or in vehicles, which drivers not financially responsible might cause. In other words, it would make the irresponsible driver financially responsible.

Against—

Increase the number of accidents because of added recklessness.

Cost high whether insurance is furnished by State or some company, because percentage of cars involved in accidents would increase, and losses must be provided for.

Increase cost for people now carrying it, since they now consist of only selected, preferred risks.

Sales will be reduced considerably in all price classes because of the first and annual cost of insurance.

Insurance would cause the careful and responsible to pay for irresponsible and reckless, for the premiums would have to be sufficient to meet all losses.

Considerable advantage would accrue to cars from other States not insured for personal injury and property damage.

Compulsory Liability Insurance would work to the detriment of citizens now engaged in selling insurance, in that part of their business would go to the State.

States would be at a loss to acquire complete data on which to base premiums.

Competition stifled by State insurance, which would tend to eliminate insurance agents.

Insurance would be issued with same lack of discrimination as licenses are issued today.

Compulsory Liability Insurance would overemphasize compensation as against the need for reducing accidents.

State would have to enter the insurance field and would not be able to reduce premiums because they are already as low as is feasible with ample protection.

State would be involved in defending its citizens causing an accident in another State, should it enter the insurance field.

Compulsory insurance would result in restricting the roads for people sufficiently well to do to be able to pay insurance.

and that those individuals who are reckless are reckless whether they are insured or not, and that they are seldom insured.

A statement published in the *Insurance Field* reads: "If laws were enacted compelling insurance for automobiles it would undoubtedly be only the beginning of restrictive legislation in the operation of motor cars and undoubtedly would result, ultimately, in the State engaging in the business itself—another wedge toward socialism."

C. H. Peay, secretary of the Nashville (Tenn.) Automobile Club, stated that "Safeguarding the interests of people on streets and roads without imposing undue restriction upon careful drivers who are not financially responsible is a perplexing problem."

Would Deny Use of Roads to Some People

T. D. Pratt, general manager of the Motor Truck Association of America, Inc., made a statement in which he said: "It would amount to denying the right to use an automobile to people not sufficiently well-to-do to protect the public by a bond or insurance policy. . . . This is a purely financial aspect of the case and if carried to its logical conclusion would make the automobile the rich man's toy again."

"The only proper way to protect the public from damages caused by highway accidents would be for the State to issue to all citizens an accident policy and collect the necessary premiums by taxation."

In Denmark a compulsory automobile liability law went into effect on July 1, 1921, which compels every owner of a motor vehicle to carry insurance amounting to 20,000 kronen for a passenger car and 10,000 kronen for a motorcycle with some company recognized by the Danish Government.

Virtually this means that the insurance companies say who shall and who shall not operate a motor vehicle, for a license cannot be issued until evidence of insurance for the required amount has been presented.

There was no falling off in automobile sales due to this law, either at the time it was enacted or when it went into effect; nor was there any marked increase in accidents resulting from reckless driving.

National Law Proposed in Switzerland

In Switzerland so many of the cantons (States) have compulsory liability insurance laws and they have proved so satisfactory that the Government has drafted an act which will incorporate many of the features of the local legislation into a national law.

The first compulsory automobile liability insurance law there probably was passed with a view to restricting the operation of automobiles. First cost and operating expense in Switzerland are approximately twice what they are here in the United States, and since automobiling was and still is considered a sport rather than a necessary means of transportation, the automobile has always remained the plaything of the wealthy. Consequently it was not to insure compensation that the law originated. Most of the people outside the urban centers like to walk, and there are tiny inns scattered at frequent intervals along the narrow, dirt roads. Since the automobiles stir up

dust, make walking unpleasant, and make the many inns for pedestrians less profitable, the motor vehicle has been looked upon with disfavor.

While the laws were doubtless restrictive in their origin, the proposed national law, it is claimed, will be constructive in its scope. All cars will be insured before they are licensed to operate in Switzerland, those coming from foreign countries will be required to take out insurance at the border.

The insurance on a passenger car is fixed at 30,000 francs, worth approximately \$5,000, for personal injuries, and 5,000 francs for property damage.

Motorcycles must carry even higher insurance against personal injury, 50,000 francs, and 3,000 francs property damage; 100,000 francs insurance is fixed for a bus of ten-person capacity, 200,000 for buses carrying up to twenty people, and 300,000 francs for buses carrying more than twenty.

In Switzerland, damages are fixed under the terms of this proposed law in a comprehensive, though complicated, manner for the many accidents which might happen—so much for a broken leg, so much for death, a fixed amount for an injury permanently incapacitating an individual.

Out of the discussion of this proposed law compelling liability insurance on every motor vehicle has developed the question of insurance to be supplied by the Government. Another proposal has been made to make liability insurance international.

Ohio S. A. A. Investigating

The Ohio State Automobile Association, which is responsible for many of the legislative recommendations concerning motor vehicles, has not definitely gone on record in favor of compulsory automobile liability insurance. In their recent report, which was unanimously accepted by all the clubs, however, it recommended "that this association authorize the appointment of a committee to investigate the advisability of the recommendation of legislation to require all operators of motor vehicles to produce to the State registrar before obtaining a license a good and sufficient bond in a reasonable sum, or an insurance policy in a reasonable amount, binding such vehicle operator to respond to all judgments for damages arising from operating such vehicle; and that such committee report to the association at the earliest possible date."

Taxicab Owners Favor This Law

The National Association of Taxicab Owners has declared for compulsory liability insurance. The National Automobile Chamber of Commerce has not yet gone on record.

One man stated that, "If the benefits of social, economic and hygienic uses of motor vehicles are to be continued, it is decidedly necessary that the motor vehicle manufacturers cooperate with the underwriters to make the highways safe for motorists and pedestrians alike."

And the president of one large automobile manufacturing company says, with a twinkle in his eye, that should many manufacturers become advocates of compulsory insurance this man referred to above probably would not call it cooperation.

Sun Begins to Shine Through Clouds in Business Sky

*Car makers far more optimistic than they were one month ago.
Steady sales gain being recorded in all price classes.*

By Norman G. Shidle

BUSINESS clouds are rolling by. The dark aspects of the automotive sky are changing rapidly and practically every manufacturer has an expression of cheerful expectancy on his face when asking or answering the time worn "How's business going?" There has been a distinct change in conditions during the last month. Companies which are holding their production very severely in line with dealer demand are building many more vehicles than they were a month ago and there are many unimpeachable indications that stocks of cars in dealers hands now have reached quite reasonable levels, except in a few instances.

Both production and retail sales figures offer solid grounds for the optimism which is beginning to pervade the industry. That optimism itself is likely to have a very definite effect in bettering business conditions. Everybody is beginning to feel good and men who wore an anxious frown a few weeks ago today are meeting their problems with a quiet smile which denotes unbounded confidence but thorough-going conservatism.

For there is nothing of a bally-hoo character in the optimism of executives. Nobody is talking about breaking output records. The term "stepping up production" is replacing the "speeding up" phraseology that has been common in the past. The change is unconscious for the most part and to a certain extent constitutes a distinction without a difference. But there is a new psychology current in the industry.

"State of Mind" Affects Business

One manufacturer, for example, believes very firmly in the practical power of a state of mind to make business good or bad. He thinks that the dealers, while they have had many troubles, have kicked a bit more than they had any right to do. He says that producing only what the dealer actually needs at the moment is all right from one angle, but all wrong from another. He points out that unless the dealer can and does anticipate his needs, the manufacturer cannot schedule production intelligently. This particular manufacturer has decided to go the whole route for the rest of this year in handling production the way the dealers would like. He is going to build cars as they need them. Already he is beginning to get a change of heart on the part of many of his retailers. They need cars and can't get them. When they understand from experience what hand to mouth building and buying means, it is the belief of this car maker that cooperation between himself and his dealers will be possible on a far more effective and practical basis than ever before.

A remarkably small amount of political talk is heard in the industry insofar as politics are related to business. One big executive thinks that 1925 will be a banner year if the Republican Party is returned to power and the European situation is straightened out, while another is convinced that his sales next year will be materially increased if the Democrats succeed in crashing the gate at

the White House. One business man expresses the view that commerce is getting better right now because the threat of the third party already has been discounted as of little importance, while another sees the liberal tide rising with considerable rapidity.

But through it all, the political situation is not being taken very seriously as a factor in business prosperity. There is a general feeling that the old law of supply and demand, accompanied by a few other basic economic factors, is going to have a lot more to do with sales than is any party or platform. Perhaps it is too early for any real political fervor to have been lashed into being, but thus far it cannot be said that the presidential campaign is having any very marked effect one way or the other on automotive business views.

Working on Dealer Problems

A very general realization exists that dealer problems are vital and demand immediate attention in many cases. It is admitted in many quarters that the dealer has some very real grievances and that he has had to bear a good many troubles in the last six months. Manufacturers in general, however, insist that the retailers must expect to bear at least a fair share of the results of any business depression. There is no question that the car builders overestimated demand at the beginning of the year. Everybody admits that. There is no question, moreover, that many dealers were asked to handle more cars than their territory was capable of absorbing under the conditions prevailing.

But, manufacturers say, production was cut very materially as soon as it became evident that demand was not going to be up to expectations. It was curtailed sufficiently to allow dealers to move their stocks until at the present time the retail field is in fairly good condition. While dealer profits have been eaten up in trade-ins and other ways, manufacturers have had deep gashes cut in their profit pies as well.

The specific declarations of troubles which have come from groups of dealers in the last six months, undoubtedly have had a good effect on the general situation, even though they have been unpleasant to some vehicle builders. Some of the complaints, although justifiable may have involved happenings which were almost inevitable. In any case, by bringing to light in concrete form some of the more pressing retail problems, it has become possible for manufacturers to give their attention to those phases of dealer relationships which most needed treatment. This has been done in recent months and the patient is improving as a consequence.

Many trade problems which look like mountains when business in general is bad, become only hills when sales pick up. That is one of the favorable aspects of present conditions. Automotive business is fair today and seems likely to be pretty good in a short time. Beyond that only the crystal gazers are guessing.

Isn't the Public Ready for the Fully Developed Car?

Four-wheel brake experience proved that buyers are interested in mechanical improvements. Others of equal importance remain to be made. Interest may center in gearset substitutes now that all feasible novelties in cylinder arrangement have been exhausted.

By Herbert Chase

SUPPOSE a responsible and well established automobile manufacturer should announce tomorrow a thoroughly developed car

1. Driven by a constant high compression or some other type of engine efficient at all loads and speeds;

2. Fitted with an evaporative or air cooling system designed to maintain a fairly high and approximately constant temperature;

3. Propelled through an infinitely variable and possibly an automatically controlled transmission requiring no gear shifting;

4. Easily controlled by effective, long wearing and noiseless brakes;

5. Having tires which afford maximum riding comfort, fitted on rims from which they are easily detached when desired;

6. Carrying a light weight, noiseless, all-purpose closed body with comfortable adjustable seats having backs which move up and down with the passengers;

7. With an attractive finish having a life equal to that of the car;

8. So designed as to insure easy riding and substantial freedom from vibration;

9. Equipped with a centralized system of lubrication which requires filling not oftener than each 1,000 miles and serves all parts of the car;

10. Designed in such fashion as to be equally comfortable and convenient in all seasons and not seriously affected by extremes of temperature, high or low;

11. Of relatively light weight and capable of averaging about 30 miles per gallon of fuel, at the same time having good accelerating ability and reasonably high maximum speed—

Suppose that a car answering the above specifications were fully developed and ready for the market today, would not its manufacturer be in a most advantageous merchandising position?

There can be but one answer to this question, even though individual engineers will disagree concerning particular specifications included in the foregoing list.

Advantages gained through superiority of product are not difficult to obtain providing the manufacturer is willing to look ahead and is ready to spend reasonable sums in development work.

1925 MODELS are matters of history so far as design is concerned.

It is time to be thinking of the 1926 and 1927 product. Here are a number of suggestions for improvements which may be incorporated advantageously.

They are not intended as criticisms of late models, but rather as ideas which have been reduced to practice in most cases and should be considered by those who aim to have their future product distinctly in advance of present practice.

Several manufacturers have announced or are about to announce eight-in-line engines to take the place of fours and sixes—an indication that they believe the public will be interested in mechanical changes. This will come close to ringing all the changes which appear feasible in respect to number and arrangement of cylinders and, in some cases, at least, is likely to have an effect which is less readily perceived than would be many of the other changes listed in the opening paragraph. In the future, variation

in number and arrangement of cylinders is apt to be of less consequence from a sales point of view than changes in other respects.

For this and other reasons, manufacturers should be looking ahead and striving to build cars which, in regard to other important units besides the engine, will excel present-day products. Engines will continue to be improved, but other parts of the chassis as well as the body are capable of equal if not greater and perhaps more important improvement.

This being the case, it will pay the automotive executive to discuss with his engineers suggestions contained in this article and to check them against present and projected designs. It is not contended, of course, that the whole list of possible improvements is exhausted in this brief article, or that all the suggestions made can be applied profitably to all or even to any one car. The writer believes, however, that nearly every engineer or executive in a controlling position can find possibilities for applying profitably at least a part of these suggestions.

Perhaps the first impression obtained from the foregoing list will be that most of the items are too far in the future to be deserving of immediate study, but a more careful consideration will show that individually most of them are incorporated in the design of some car which now is in production either in this country or in Europe, while practically all the others are in use on experimental cars, which can be seen by any one with a legitimate interest in them.

With this preface in mind, let us consider, approximately in order, the items listed:

From the standpoint of performing reasonably well the function for which they are intended, present-day engines

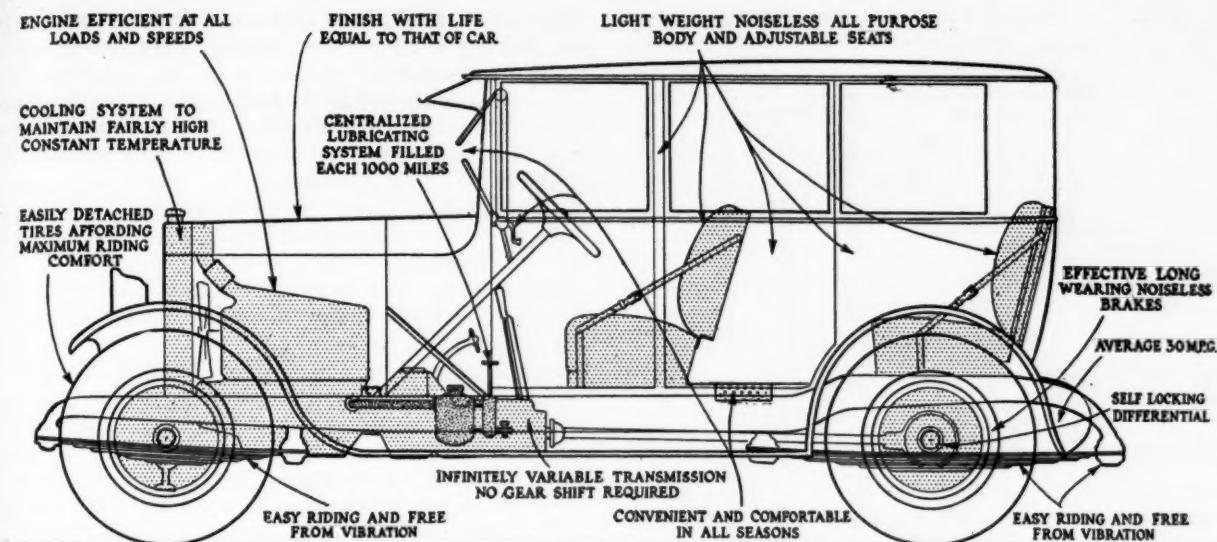


Diagram indicating a number of possible improvements in car construction

are fairly satisfactory; that is, they are dependable, have sufficient power and give relatively little trouble. Nevertheless they are not efficient at part loads, often are rather too complicated, are given to carbon formation and are subject to other disadvantages incident to the imperfect utilization of available fuels and oil.

Among the most promising types of engine calculated to give higher economy, especially at part load, is the constant compression type, several variations of which have been described in these columns from time to time. All two-stroke engines are inherently constant or virtually constant compression types and while, in the conventional arrangement, they have certain disadvantages, these can be overcome by intelligent design, as was demonstrated in the single cylinder Newcomb engine described in this publication about two years ago. In a car about the size of a Ford this engine performed exceedingly well and was capable of driving the vehicle 70 or more miles per gallon.

This is cited simply to show what can be done in the way of high economy with constant compression (and in this case a localized charge) at the same time using a very simple engine. It also is evident that the two-stroke cycle is by no means hopeless, although not inherently necessary for constant compression.

Some form of fuel injection used in combination with a constant compression non-throttling four-stroke engine also is among the interesting possibilities. Such an engine would be highly economical and would avoid entirely the troubles due to unequal distribution, which constitutes one of the most difficult problems faced by the engine manufacturer today.

Other Powerplant Improvements

Among other items related to powerplant design which are worth study may be mentioned the wider use of light alloys, notably those containing aluminum and magnesium, the use of air cleaners of adequate size to effectively remove abrasive particles of dirt and of means for preventing dilution of crankcase oil or removal of diluent and water which enter the crankcase, use of a lubricating system which insures good lubrication at all times and especially during the starting and warming period and provision of effective and easily cleaned oil filters together with conveniently operated oil drain cocks of good size.

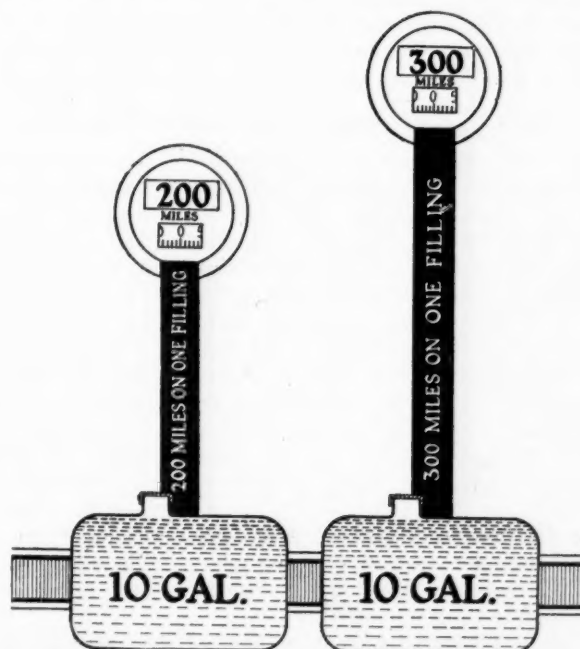
Excessive use of the choke is one cause of dilution. The choke should be replaced by some other better device to aid in securing a quick start. Some cars use an electrically heated vaporizing device with good results.

For various reasons it may not be expedient to make any

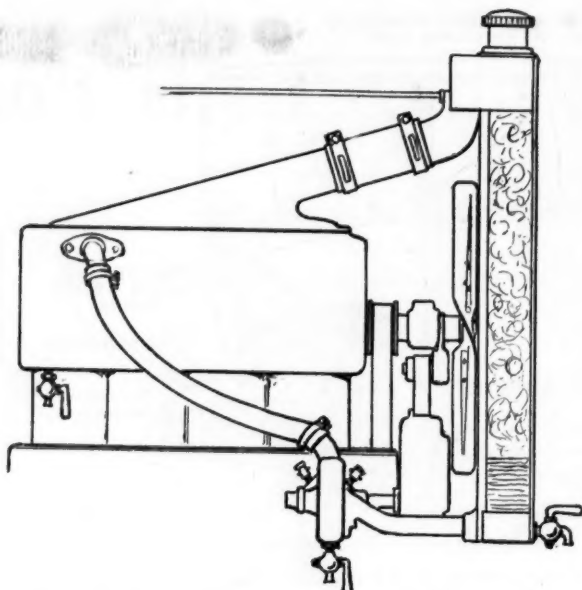
sudden departure from the more or less "standard" engine design now prevalent, but the important thing to bear in mind is the fact that we are a long way from a finality in present engines, while departures from the conventional type do hold considerable promise. In fact some large manufacturers are known to be keenly interested in certain unorthodox designs and are not unlikely to have a novel and well developed type to "spring" when the time is ripe.

There are many signs of dissatisfaction with the water cooling systems now in general use. Strangely enough these do not pertain, in general, to a lack of cooling ability, but rather to a condition which may be described as overcooling. While maximum temperatures are too high in some cases, due chiefly to local overheating caused by steam pockets which should not exist, more trouble undoubtedly is occasioned by too low minimum and average jacket temperatures.

All water cooling systems suffer from the disadvantage that the engine must operate for some time before it attains a satisfactory, or possibly even a safe operating temperature. Frank Jardine, in an article which appeared recently in these columns, showed that serious piston scor-



The average car of the future should be capable of 50 per cent greater mileage per gallon of fuel



Evaporative cooling or other means for attaining quickly and maintaining fairly high uniform temperature deserves attention

ing sometimes is caused by operating an engine with cold jackets even for a few minutes, yet this is precisely the condition encountered after starting an engine which is cold, especially in winter weather. Considerable time elapses before the water in the system attains a good working temperature even when thermostats are used to control the flow.

Furthermore, cold jackets cause condensation of water from the products of combustion and prevent vaporization of liquid fuel which may be deposited on them. Both the water and the fuel find their way to the crankcase where they mix with the oil. The consequent dilution is known to result in rapid wear, while water results in corrosion, especially if any sulphur from the fuel is present, and probably has an adverse effect upon lubrication.

With hot water in the jackets no water is condensed in the cylinders and any water in the crankcase, if circulated with the oil, soon is evaporated. Much the same is true of fuel. If this is not completely evaporated, much less of it reaches the crankcase, while even some that is there already may be evaporated. Evidently, then, it is desirable to keep the water in the system warm and to reduce the quantity of water to a minimum required for safety.

Small Jacket Space Aids Rapid Warming

This indicates that it is desirable to make the jacket space as small as possible consistent with adequate circulation. An excellent plan, followed with success even on heavy duty aircraft engines, is to arrange the pump to discharge into or near the top of the jacket, in the vicinity of the exhaust valves or other parts of the combustion chamber which may tend to overheat, leaving the water in that part of the jacket below the head and surrounding the cylinder bores to circulate only by thermosyphon action.

So-called "steam" or evaporative cooling systems (which, by the way, keep the jackets filled with water, not with steam) produce higher average temperatures, require a minimum amount of water, a smaller and lighter radiator, need have no thermostat, and have a number of other advantages. They are deserving of and are likely to receive careful consideration by car engineers in the near future. Even the conservative Rolls-Royce company is known to be interested in such a system.

A more efficient and better located fan is possible in many designs. With this there should be assurance of adequate vents for exhausting air which passes through the

radiator. Often a lack of these two items makes it necessary to use a larger and heavier radiator than would be required otherwise.

A radiator shroud also can be used to good advantage as a means of insuring effective use of the entire radiator core. Ordinarily the fan draws air through only that part of the core which it covers.

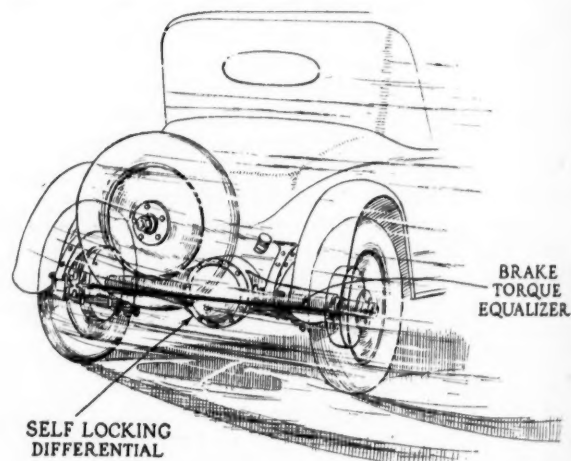
All radiators should be provided with a suitable drain cock which can be reached and opened easily without contact with greasy or dirty parts.

Air cooling also possesses possibilities some of which have been realized in practice and others not. Chief among the advantages, in our view, is the freedom from the nuisance caused by the possibility of freezing in winter weather, and of bothering with water at any season. There are, however, considerable differences in temperature of cylinder walls as between summer and winter, with much the same results as in water cooled systems, unless thermostatic control of air flow or its equivalent is resorted to.

We hear much talk of displacing the present gearset with some mechanism which will not involve gear shifting, or at least a variable gear reduction. Many such devices were described in AUTOMOTIVE INDUSTRIES for July 3, 1924.

Although the conventional gearset is a dependable and well worked out device, it has disadvantages which may cause it to be superseded by some other mechanism which may be automatically variable or hand controlled, but which need not be disconnected from the power source during the shifting period, and preferably will have no breaks in the continuity of torque while shifting.

Some highly promising developments along this line are in progress and modifications in transmission are likely to



A brake torque equalizer and a self-locking differential will help to prevent skidding or stalling

be the focusing point of engineering and possibly commercial interest a year or two hence.

In the interim, at least, there is sure to be much attention paid to means for making gear shifting easier or semi-automatic. Some such devices have been used to a limited extent already and are to be used more extensively on 1925 models.

Braking effectiveness has been improved on most American cars in the past year or two. Concerns which have not adopted four-wheel brakes have, in general, increased the size or bettered the design of foot brakes and in some cases the hand brakes also. Not all four-wheel brakes are as easy to operate as might be desired. Improvements in this direction deserve attention. There still is great need also for improvement in hand brakes on many if not most cars. In some cases these brakes are scarcely adequate for holding the car when parked on a slight grade, much less

stopping it in case of emergency should other brakes become inoperative. Obviously this is a condition which should be remedied. At the same time a better ratchet and pawl design often can be added to advantage.

Much has been done by the Bureau of Standards as well as by brake-lining and some car manufacturers to improve the durability of brake linings. Their life has been increased several fold in some instances. It is desirable to take advantage of this improvement rather than to buy merely on a cost basis without regard to quality. There is need also to pay more attention to quality of brake drums, both as to material employed and to securing drums

NOW that the industry has a capacity for production of passenger cars which is in excess of demand, competition is bound to be keen. Hence there is every reason why manufacturers should seek the advantage which improvements in design may give. The tendency to gain advantage by decreasing price through economy in production is likely to continue, but it must be remembered that the automotive industry already has gone farther than any other comparable industry along this line, so that advances in this direction are apt to be slow and comparatively difficult.

which are truly round and do not go out of shape under service conditions. Braking surfaces should be machined and the drum flanges should be thick enough to minimize distortion and aid in preventing chattering.

Screeching brakes are far from being a good advertisement for any car. Greater rigidity in construction of brake parts, surfaces which are true and smooth, and materials which are selected carefully, are among the items to be considered. Drums of higher carbon content pressed from thicker materials than have been used generally now are available and have distinct advantages.

Engineers differ in their views concerning air, vacuum and other power operated brakes. Many feel that anything which adds complication is to be avoided. It is not to be denied, however, that smooth, effective and easy operation can be attained by some power operated brakes.

There is some difference of opinion concerning the desirability of brake equalization, but most engineers favor some form of equalizer. The type which is designed to equalize the braking torque of the wheels on each side of the vehicle possesses certain advantages, notably a tendency to prevent skidding due to unequal braking on the two sides of the car.

As to tire equipment, there seems to be but little doubt that the balloon type will become practically universal once means have been found to overcome certain difficulties incident to its use which have been outlined fully in these columns from time to time. Such tires are an established success on many cars already. Whether they ultimately will be applied generally on drop base rims is a question, but there is much to be said, especially from the user's standpoint in favor of the drop base rim, which makes it possible to change tires easily and without the use of any tools.

Easy steering should be secured, without too great sensitiveness and tendency to wheel wobble. In one recent design using a disk wheel this has been accomplished neatly by bringing the knuckle pivot quite close to the central plane of the wheel and using only a small angle of rearward tilt (without transverse tilt) to give castering action.

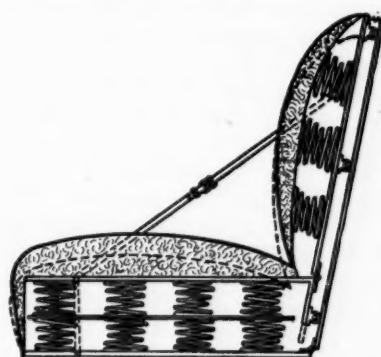
A body which is noiseless when the car is in motion, free

from drumming and comfortable for all passengers is, of course, a great asset to any car. Closed bodies seem certain to become the predominant type and will be considered primarily in the following comments. The average modern closed body is quite heavy and because of its weight and a form of construction which demands rigidity, requires a heavy and rigid chassis frame. This, in turn, adds to the weight of the chassis and demands heavier axles and running gear. Conversely a light flexible body permits of a lighter chassis, smaller engine and lighter running gear and axles. Hence such a body is well worth striving for, providing, of course, it answers other requirements such as comfort, appearance and durability.

The fabric body, at least in the form advocated by Weymann, appears to answer these specifications in many respects, if one can judge from experience abroad. It is light, flexible, noiseless and non-resonant, while in construction it seems to lend itself well to quantity production methods and practically eliminates paint shop operations. With slight modifications it can be given almost any desirable contour and thus makes it possible to secure the desired body lines.

Closed bodies seem to have made about as much of a hit with the farmer as with other users, but in general they lack some of the all-purpose features which tend to make them available for carrying some freight as well as passengers when occasion demands. The suggestion advanced some time ago in these columns that the rear panel of the body be made in the form of two doors which can be opened outward when desired and the rear seat be folded against the back of the forward seat to give clear space for freight carrying is worth further consideration. It is not suggested, of course, that such a feature is suitable for all closed bodies, but it might be used to advantage on a large production, all-purpose type.

More comfortable seats are needed in cars of practically all grades. Seats which are adjustable readily to fit pas-



A seat in which the back moves up and down with the passenger has obvious advantages

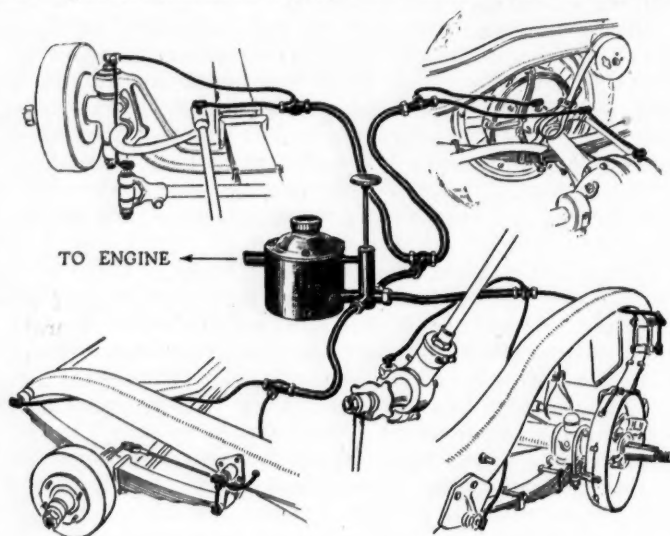
sengers of different size, especially as to back position, should not be overlooked. Especially is it desirable to develop some form of construction such that the backs of passengers do not continually polish the seat backs as the passengers move up and down under the influence of spring action. A seat back which moves with the passenger has much to commend it.

Body interiors which are cleaned easily and quickly have obvious advantages. The luxurious interior has its place on cars for certain purposes, but for general use trimming materials which wear well, show dirt as little as possible and are cleaned easily are more suitable.

Details such as means for excluding water sometimes are forgotten. A leaky hood may cause great inconvenience by causing ignition failures when the car is most needed, while a visor which has no gutter at its lower edge is apt to shed water on the windshield glasses in such quantities as to make it difficult to keep it out of the driver's compartment. Clear vision also becomes more difficult under such conditions.

Rapid strides have been made during the last two years in the way of improved finishing materials, and car and body makers who have not availed themselves of these finishes will do well to investigate them thoroughly. Not only have they much greater durability than most other finishes used to date, but in many cases they offer decided advantages from a production standpoint.

The greater expense of colored finishes of reasonable durability has operated against their more general adoption. Now that they are available they are likely to be used extensively. Thought should be given in this connection to the superstructures of closed cars. Even when colors are



A centralized lubricating system with only one filling point is a great boon to the user

used on the body, a black top is fitted almost invariably. Much chance for distinctive appearance thus is sacrificed.

Black roof coverings also are more prevalent than need be. In the summer they absorb heat and help to make the interior of the car too warm for comfort. Lighter colored coverings are used effectively in Europe and should be given due consideration in this country.

Comfort in closed cars at once suggests better ventilation, an item which is dependent partly upon windshield design. There appears to be no reason why windshields should not be provided with easy means for setting to any desired position while the car is in motion and without any of the inconvenience which now is associated with such settings on nearly all cars. One writer who analyzed the matter of windshield design in these pages recently takes the view that, with a proper design, no cowl ventilator, windshield wiper or rubber filler strip between upper and lower glasses are required.

When considering the matter of comfort, the very important item of chassis spring design must not be overlooked. Often the springs which are good for one body model are decidedly wrong for another body on the same chassis. There is need, however, for springs which become stiffer as the load increases and often also for means of absorbing short high period vibrations, which are most uncomfortable in some cases, even with very good springs.

Non-metallic shackles or their equivalent help to prevent noise and seem to have improved riding conditions in some cases, while the insulation of the engine on rubber blocks to prevent its vibrations from being transmitted to the chassis frame, body and passengers, has some advantages. A proper selection of the point of attachment of the engine to the frame in relation to the center of percussion also has been found of advantage in the case of the Maxwell car.

An improvement in chassis design which is much needed

from the user's standpoint is the fitting of some form of lubricating system such that all points requiring lubrication are fed from a central reservoir. Such a system has been adopted by Cleveland and is being considered by others. Without such a system the user is almost certain to neglect to lubricate some parts and often neglects them all. Such a system might easily be so connected with the engine that oil need be put into the vehicle at one point only, at this time filling both the engine sump and the reservoir of the chassis system.

Headlamps of reasonably heavy gage metal and substantial construction, properly rust-proofed and watertight, and made easily adjustable, should be on every car. Too much in the way of safety is dependent upon good headlamps to justify scrimping in this direction. A lamp which gives good illumination to the rear when backing also has obvious advantages. It can be combined readily with a tail and stop light to form a convenient and substantial unit.

Winter weather brings a marked reduction in the use of passenger cars due in part to the fact that they are less comfortable to use in cold than in warm weather. While cars probably never will be used as much in winter as in other seasons, there is no reason why the difference in utility should be as great as at present if cars were better suited to cope with seasonal weather variations.

Provision of suitable heaters, better protection against the elements, especially damage from frost without a lot of bother, equipment with tires which afford better traction on snow and ice, use of some form of locking differential, such as the Andrade, which obviates stalling due to the ordinary differential action, means for assuring easier starting and avoiding damage due to dilution of crankcase oil, facilities for easily draining radiator and crankcase when conditions require, are among the things which can be done or provided.

NOT long ago it was maintained by some observers that the public is not interested in mechanical improvements in cars, so long as the desired performance is secured. There is an element of truth in this contention, but the fact remains that no little interest has been displayed recently in four-wheel brakes and that this interest was manifest readily enough when the advantages of such brakes were explained and long before the public had an opportunity to learn their advantages first hand. Is there any reason to doubt that prospective buyers will be similarly interested in other improvements which are quite as easy to demonstrate as those relating to brakes?

It is agreed, in general, that light weight is desirable, but too often the saving is not realized in practice. As pointed out, however, a lighter body is possible and it, in turn, requires lighter chassis frame, propelling units and running gear. Balloon tires which help to minimize shocks also should be instrumental in helping to make the weight of some parts less, while lighter structural material, especially aluminum, if its price were lower, could be used to the same end.

Lighter cars require less power to propel them, which in turn means lighter and more economical engines. A car which will average fully thirty miles on a gallon of fuel is by no means a dream impossible of realization. It is quite within the bounds of possibility and that without going to the diminutive type which is popular in England and on the Continent.

Just Among Ourselves

Speed in Traffic Courts Grows Apace

BEGINS to look as though the New York traffic courts will have speedometers installed as standard equipment. One judge the other day handled traffic cases at the rate of four a minute for an hour. In sixty minutes he disposed of no less than 240 cases. The scales of justice must be well lubricated to stand a strain as great as that. To achieve a record of this kind it would seem that punishment must begin with arrest, leaving to the highly trained judges only the clerical job of assigning and collecting the fine. While the courts in general are clogged with cases awaiting trial, that all the facts may be brought in so as to assure justice, the traffic courts apparently are going merrily on their way dispensing decisions as rapidly as the "crimes" are stated. Speed in the courtroom may be just as dangerous as speed on the highway.

Power of Industry Behind Traffic Booklet

EVERYBODY who read the news columns of AUTOMOTIVE INDUSTRIES thoroughly last week knows about the little booklet on "Getting the Most From Your Car," which has been published by the N. A. C. C. Traffic Planning and Safety Committee, and which will be placed in every automobile as it is shipped from the factory. The pamphlet itself is small, but the power of a big industry, reinforced by the endorsement of the President of the United States, is behind it, and its circulation will be one which the most popular of the popular magazines might envy. This interesting, familiar talk on the common places of traffic and

safety as related to the car owner is almost certain to wield a great influence in solving one of the most vital problems before the automotive industry today. Its publication is of real significance because it marks the most definite and specific effort yet taken officially by the industry to combat the traffic accident evil.

Loading Time Interests Machine Tool Buyers

IN spite of rumors to the contrary, a quiet campaign of machine-tool buying exists at present in the automotive industry. Most of the buying is in the field of machines which render advanced or improved types of service rather than the purely conventional standard lines. A new element is entering seriously into the consideration of the design and operation of this type of service as loading time is rapidly becoming one of the decisive factors. With the improvement in machining service, which is nothing more nor less than the purpose of every machine in the inventory list, the capacity of the machine is often established by the time required to remove the finished part and chuck the new piece. Several of the more advanced machine-tool builders have shown an appreciation of this factor and consequently are doing a good business.

Easier to Charge for "Repairs" Than "Service"

ST. LOUIS automobile dealers have stopped using the word "service" and have substituted for it the word "repairs." The idea seems good but the task gigantic. The purpose, of course, is to get away from the implication of something for nothing

that almost inevitably hangs about the word "service." People expect to pay for repairs; too often they expect to get service free. Just the same, the automobile dealer always will have to give service as well as repairs. He can and should get away from giving repairs without charge, but there are services of courtesy, prompt compliance with customer's needs, consistency in repair policies and little acts of personal helpfulness constituting the sales phase of maintenance work which always will be a part of the well-regulated dealer establishment. "Repairs" can well be brought in as a running mate to "service."

To Warehouse or Not to Warehouse

CONSIDERABLE difference of opinion seems to exist in the industry about the advisability of car manufacturers warehousing more finished cars than has been their custom in the past. Three or four companies have been considering definitely the construction of warehouse facilities at the factory to act as a buffer between production and sales during the winter months. A good many executives, however, are strongly opposed to any move of this kind. The suggestion that public warehouses might be used to advantage for storage of this kind is not meeting with great approval. One company which paid out over \$100,000 in warehouse charges last winter had unfortunate experiences in almost every city in which it tried the public warehouse experiment. Cars had to be refinished, in many cases, and distributors were encouraged to overestimate their needs. The warehousing question is getting some attention, nevertheless, in a number of factories. N. G. S.

British Manufacturers Cut Production Costs by Keeping Equipment Flexible

American methods used only with many modifications. Growth in use of automobiles built new towns in this country, but has to be fitted into previously organized communities in England.

By Harry Tipper

ANY study of the problems of production as presented to the British motor car manufacturer must take into account the great difference in the market, the social structure and the relation of the manufacturer to the owner.

Looked at superficially from the viewpoint of our experience the production methods of the British manufacturer appear to be somewhat slow and out of date, but this would be erroneous and lead to very absurd conclusions.

It is impossible to consider the British market entirely in this article. The subject will be covered fully in a later issue, but the production problem requires the statement of a few elements which are fundamental to its consideration and in which it presents a different picture from the United States.

The fundamental difference lies in the fact that this country was completely organized and almost completely built as it is today without any thought of the car. It is closely knit, somewhat crowded and cannot be easily rearranged for rearrangement is a very costly, slow process.

While in the United States we have built residential sections, roads, towns, composites, golf clubs, etc., to suit the motor car the British manufacturer has been obliged to build a motor car suitable to meet existing conditions.

As between the wealthy man who owns an estate and the skilled worker who lives in one of a row of cottages, there is a wide range, not only in the economic status, but in the ownership of conveniences and the possibility of adapting the living to further conveniences.

In the United States, a great proportion of workers and shopkeepers can build garages to suit the cars they buy, but in the British Isles the cars must be built to suit the houses already built without any easy method of alteration. Cars must suit the taxation laws, the price of petrol and the strained subject of the Englishman who is heavily taxed on all he earns.

The Man Who Buys a 7 Hp. Car

There is a wide difference in the conditions of the man who buys an Austin 7 hp. light car and the man who can house and run a 6-cylinder Buick, much wider than the difference between the living of the Ford owner and the owner of a Cadillac in the United States.

These things affect the number, variety and sale of the car and consequently the problem of producing them.

There are no exact statistics of the number of motor cars produced by the British makers, because many of them do not publish the figures, but the statements of three of four authorities agree within 5000 so that a basis of 70,000 is approximately correct. One manufacturer is responsible for about 50 per cent of these cars, two or

three others for 30 per cent and the remainder, a very large number, produce the remaining 20 per cent. There are more manufacturers of motor cars in this country than there are in the United States, and many of them build but a few cars each year.

As with us the large product is of small cars and in the hands of a few concerns, although a small car in England is much smaller than a Ford in horse power.

The quantity production is of cars 8 to 14 hp., and on a two to five seater basis principally.

These small cars are quite roomy, astonishingly so for size and wheel base and they are speedy on the roads, most of which are no better than the roads in the eastern part of the United States, but are maintained more adequately.

Hand versus Volume Production

The work of manufacturing this variety of types, body designs and range of horse powers, naturally includes all methods of manufacture from Morris-Cowley, who has outdistanced our own methods of specialized mass production in some ways to Rolls Royce who do not even use a jig in their mechanical operations.

Any attempt to compare this condition, or its desirability with our own methods in the United States would be futile and absurd. There are however methods of value to us in the materials and operations employed in British factories, and there are elements of cost which are valuable as a means of considering the relative economic requirements on the basis of quantity produced. In general the machine shop equipment for the production of engines, transmissions, gears, axles, etc., is much the same for standard machine practice as the work done in the United States. There are few special machines in the shops. Several of the larger shops have single purpose machines here and there, but in no case are these departures important save in the Morris-Cowley works at Coventry where special methods are being introduced which depart from current practice enough to demand separate treatment in future articles.

Centerless grinders are just beginning to come in for small parts but grinding is not used to the same extent. Turret lathe, and engine lathe practice is practically alike, although most of the shops run the machines at a somewhat slower speed. Automatics are confined to screw machine products and small pins, etc. There are few semi-automatic lathes. Turret lathes are used in many of the shops as general purpose machines by means of jigs and a definite series of tools in the turret.

Direct labor is mainly piece work. In fact, most of the shops operate on a piece work basis through the whole factory. Earnings vary on this basis from \$15 to \$75 per week.

The percentage of selling price devoted to direct labor is from 10 to 15 per cent according to the shop in all except the custom built factories where it is considerably higher; so that it compares favorably with the direct labor cost in our own machine shops. On the other hand the overhead frequently is 150 per cent of the direct labor and material cost and in the smaller shops it goes up as high as 300 per cent. In one or two of the larger shops the overhead is down to 100 per cent, but this is done by methods quite different.

How Cars Are Built in England

The outstanding characteristics of the British shop are the

1. Small quantity lots.
2. Flexibility of operation.
3. Line subassembly.
4. Simple stock room methods.
5. More fitting.
6. Less tooling.
7. Handwork on bodies.
8. Lighter materials.

There are several exceptions to these conditions notably the Morris-Cowley engine and transmission shops, the Austin engine unit shops and some of the larger units, but the facts hold good for most of them. The machines are usually driven by group motors, but several of the manufacturers are going to use unit drive on new machines.

British shops would be considered under tooled for many products made and used in America. The large pressing equipment to be noted all through the industry in the United States is almost absent in the body making in this country. Crossley has a rather elaborate equipment for this purpose, Austin has rearranged some war machines, but mainly the body metal, fenders, etc., are rolled and then shaped by hand. Pressed steel equipment and dies are too expensive in overhead and operation for the small quantities and many sizes required to take care of the English market.

As a consequence the body metal is quite light, 16-gage sheet being used generally for panels and fenders. It is customary for the body to contain more wood, but in some of the lighter cars the bodies have been stiffened with the same gage metal by ingenious elements of design.

This metal is readily worked by hand and as a consequence the body shop of a British motor factory presents a curious appearance. Little capital is involved in either equipment or dies, but a good deal more space is required and almost the entire cost is in the labor used.

Labor Saving Devices Are Few

There is little opportunity for the British manufacturer to use the many labor saving devices for moving materials so familiar to the production engineer in our own tremendous factories. Conveyors are installed where possible, but their uses are not many. Elaborate painting and enameling equipment is replaced by very simple arrangements. Overhead trolley systems can be efficiently employed in a few cases only.

Practice in the wood-working shops for body building is much the same as in the United States in the larger plants. Lumber is kiln-dried, dressed, cut, shaped, etc., by jigs, and fixtures, using equipment of a similar character although not in the same amount or variety on account of the smaller operations.

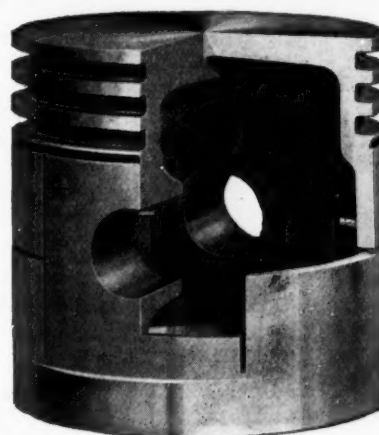
In general the situation might be summed up as follows: The British manufacturer could adopt very few of our methods without modification and these only in one or two cases. His production problem calls for maximum flexi-

bility, minimum tooling, adaptability of metals and processes to smaller quantities and ease of change in accordance with a fluctuating market requirement with a wider variety in demand. To meet these requirements he uses mainly standard tools, minimum special equipment, more labor, more fitting and less tolerance assembly. His machine shop cost is comparable, taking into account the difference in wage rates except that overhead is generally somewhat higher. His body shop costs are less, labor cost being greater, but overhead much less. Cost keeping, stock keeping, inspection and similar induced departments are usually much simpler in character and less costly per unit.

In general the manufacturing cost is not notably higher, quantity considered, but the methods are quite different. Some of these represent imperious modifications which will require separate treatment.

Light Alloy Piston Developed Which Is Said to Prevent Slap

IN the Sterling light alloy piston, which is manufactured by the Sterling Products Corp. of St. Louis, slitting of the skirt is combined with double tapering, with the object of preventing piston slap under one extreme of operating conditions and seizing of pistons under the other. There are four longitudinal slots in



Cut-away view of the Sterling light alloy piston

the piston skirt, extending from the ring belt to about $\frac{1}{2}$ in. of the lower edge, and in addition two circumferential slots, extending through the bearing surfaces from one longitudinal slot to another. It will be readily understood that this arrangement of slots makes the bearing surface slightly yieldable.

At the top end of the piston the diameter is made 0.015 in. less than the cylinder bore; at the bottom of the ring belt, 0.005 in. less; at the circumferential grooves, 0.005 in. more and at the bottom of the skirt, 0.010 in. less. Undue expansion due to excessive heating of the piston is compensated for by the yielding of the slotted skirt and there is said to be no danger of "binding" or "freezing."

A GOOD deal of information on tool steels, tool making and hardening and heat-treating equipment is contained in the Columbia Tool Steel Handbook issued by the Columbia Tool Steel Company, Chicago Heights, Ill. The handbook also contains other information, largely in tabular form, that should prove useful to the designer and shopman.

Packard Recommends Special Service Equipment for Its Dealers

Time for carbon and valve work reduced thirty per cent by use of portable stand equipped with everything a mechanic needs for this operation. Tools of special and standard design provided.

By Donald Blanchard

A THIRTY per cent reduction in the time required for a carbon and valve job on the Packard Single Six engine has been effected through the development of a portable tool stand containing everything a mechanic needs to perform this service operation. The stand was designed and its equipment determined by the Technical Service Department of the Packard Co. after a thorough study of carbon and valve work on both six and eight cylinder engines.

The factory is distributing the stand among its dealers, complete with all its equipment including a $\frac{1}{4}$ in. portable electric drill, at a price of \$92.74. Considering the time economies it makes possible in conjunction with the fact that carbon and valve work forms a large percentage of all the work handled in a service station, it is evident that the stand is a good investment from a dealer's standpoint.

The Packard flat rate schedule places a time allowance of 7.2 hrs. on the carbon and valve job on the six-cylinder engine. With the stand, the average mechanic can do the work in 5.1 hrs. and, if an electric valve grinder is added to the equipment, the time can be still further reduced to 4.6 hrs.

When a mechanic is assigned to a job, the usual service station practice is for him to go to the tool room and draw such tools as he thinks he will need in addition to those in

his kit. Frequently he overlooks some items and does not discover his oversight until he needs the article he has neglected to provide himself with. This means either of two things. He must go back to the tool room to get it or else do without it; lost time being the result in either case. For example, suppose he forgets a special wrench and, rather than return to the tool room for it, he uses some other wrench as a makeshift. Obviously he won't work as fast as he could with the proper tool.

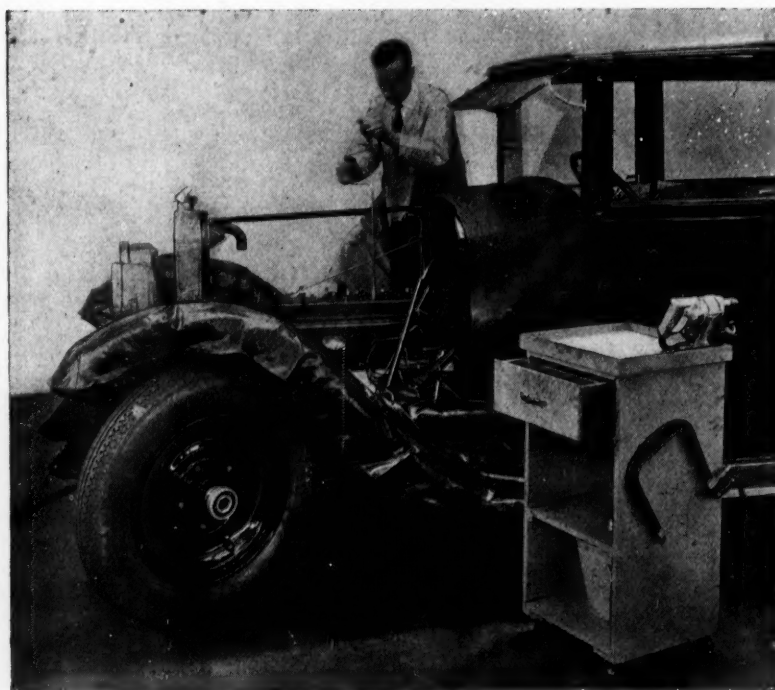
With the stand, however, the mechanic draws everything needed for a carbon and valve job on either the six or eight-cylinder engine, on one tool check. Nothing is overlooked. Once he rolls the stand up to a car he is in a position to carry through without any interruption, nor is there any reason for him to enter the tool compartment of the car on which he is working. This last advantage is of considerable importance as these borrowed tools are frequently not replaced with resulting complaints from customers.

The stand itself is a substantially built wooden structure mounted on four casters. It provides compartments, shelves and drawers for the storage of the equipment and, on its top, there is a holding clamp for the electric drill. In addition to the tools required for the work, there is a pail for use in draining the radiator, a set of cowl and fender covers, a starting crank, wire brushes for use in conjunction with the electric drill for cleaning carbon, etc.

The tool equipment of the stand is for the most part standard. There are, however, a few special tools which the Packard Co. has designed as a result of the study of this class of service work. For example there is a special speed wrench for taking off the cylinder head nuts. No standard brace was available which could be operated without interference with the radiator tie-rod. Consequently one was designed with an extra long shank so that the mechanic can run these nuts off quickly from a convenient working position.

Similar studies of other common service station jobs are being made with a view to making comparable time economies on them. Brake work is at present receiving attention, and analysis of the jobs handled over a period of months by a large distributor's service station, shows that about 17 per cent of the total were in this class. This places it next to carbon and valve work, which constitutes about 30 per cent, in point of frequency.

Naturally the competition between the authorized dealer service station and the independent general and specialized repair shop is keenest for the common repair jobs such as carbon, valve and brake work. The dealer has little competition for



Removing the cylinder head nuts with the special, long shank speeder wrench. Cowl and fender covers are in place and the carbon and valve stand is shown beside the car

Equipment Contained in Packard Carbon and Valve Tool Stand

Putty knife.
Hair brush.
Wire brush.
Carbon brushes (2).
Cylinder head lifters.
Fuelizer plug wrench.
Fuelizer plug puller.
Cylinder head nut wrench.
Cylinder head speed wrench.
Spark plug speed wrench and handle.
Carbureter wrench.
Set of tappet wrenches (3).
1/4 in. x 5/16 in. open end wrenches (2).
7/16 in. x 1/2 in. open end wrench.
9/16 in. x 5/8 in. open end wrenches (2).
Breaker point wrenches (2).

Valve grinding spring.
Feeler gage.
6 in. screwdriver.
Pliers.
Starting crank.
Valve lifter.
Fleming valve guide cleaner.
Carbureter jet wrench.
Pet cock drill rod.
Breaker point file.
Can of grinding compound.
Funnel.
Chuck for electric drill.
Extension cord.
Water pail.
Gasoline pail.

Fender covers.
Cowl cover.
1/4 in. electric drill.
Scraper for spark plugs.
Drill stand.
Oil can.
Valve racks.
Pushrod rack.

Cost—\$92.74

Auxiliary Equipment

Black & Decker electric valve grinder.
Speedo multiple valve lifter (2).
Combination valve refacing outfit.
Flywheel timing mark indicator.

Cost—\$61.90

the uncommon jobs, for this class of work is less profitable. It is with the idea of placing its dealers in a position to offer the strongest possible competition for the classes of service work that can be obtained in profitable volume, that the Packard company is carrying on this work on the most common service operations.

Considerable special service equipment, in addition to the carbon and valve tool stand, has been developed and is available to Packard dealers. This equipment is all of a special nature as the Packard company has undertaken to develop and distribute only such tools as are not available to its dealers through regular jobbers. In other words, where a special tool would reduce the time required for a job or improve the quality of the work and none is available on the open market, the company provides one.

This equipment is all listed in a loose-leaf booklet which is distributed to Packard dealers, and is priced at cost plus a moderate handling charge, no effort being made to make a profit on it. It is sold through Packard distributors who add nothing to the factory list. Each item has a number, and the dealer orders and is billed for it just as though it were a service part. Consequently no special correspondence is necessary.

The total cost of the equipment listed in the booklet is about \$170, but the company does not expect all of its dealers to purchase the complete assortment. Instead a list totaling \$36.35 has been made up which is recommended for the small dealer, while for the average dealer another selection totaling \$72.50, or \$126.25 if the shop handles bearing work, is recommended.

Automotive Shipments for May, 1924 from Canada.

| Countries | Cars | | | Parts | Trucks |
|--------------------------------|-------------|-----------------|-------------|-----------|-------------|
| | Up to \$500 | \$500 to \$1000 | Over \$1000 | Value | Up to 1 Ton |
| Europe | | | | | |
| Belgium..... | | 16 | 9 | \$1,060 | |
| Denmark..... | | | 2 | 64,430 | |
| Germany..... | 33 | 34 | 64 | | |
| Irish Free State..... | | | | 8,570 | |
| Netherlands..... | | 6 | 7 | | |
| Norway..... | | 4 | | | |
| Poland and Danzig..... | | 13 | 13 | | |
| Spain..... | | | | 15,481 | |
| Sweden..... | | 20 | 37 | | |
| Switzerland..... | | 18 | 2 | | |
| Turkey..... | | 7 | | | |
| United Kingdom..... | 664 | 72 | 130 | 41,564 | 98 |
| North and South America | | | | | |
| Costa Rica..... | | | 1 | | |
| Guatemala..... | | | 3 | | |
| Salvador..... | 12 | | 3 | | |
| Mexico..... | | 16 | 6 | | |
| Newfoundland..... | 12 | 2 | 3 | 165 | |
| Barbados..... | | 4 | | | |
| Jamaica..... | 2 | | | | |
| Trinidad and Tobago..... | | 3 | | | |
| Other British West Indies..... | 4 | 1 | | | |
| Cuba..... | | | 3 | | |
| Dominican Republic..... | | | 1 | | |
| Argentina..... | 56 | 19 | 27 | 25,688 | |
| Brazil..... | 3 | 4 | 19 | 26,800 | |
| Chile..... | | | 4 | | |
| Colombia..... | | 1 | 4 | | |
| Asia | | | | | |
| British Guiana..... | 3 | 6 | | | |
| Uruguay..... | | 1 | | | |
| Venezuela..... | | 2 | 4 | | |
| Oceania | | | | | |
| Aden..... | 6 | | | | |
| British India..... | 276 | 65 | 2 | 15,063 | 136 |
| Ceylon..... | 49 | 7 | 3 | 6 | 34 |
| Straits Settlements..... | 113 | 26 | 1 | 10,745 | 14 |
| Dutch East Indies..... | 82 | 6 | | 626 | 43 |
| Hongkong..... | 4 | | 4 | | |
| Japan..... | 13 | 5 | | | |
| Palestine and Syria..... | 1 | | | | |
| Siam..... | 8 | | | 3,214 | 12 |
| Africa | | | | | |
| Australia..... | 1,006 | 34 | 24 | 71,510 | 600 |
| New Zealand..... | 644 | 140 | 27 | 20,123 | 88 |
| Other Countries | | | | | |
| British West Africa..... | | 1 | | 3,521 | |
| British South Africa..... | 142 | 64 | 16 | 6,154 | 6 |
| British East Africa..... | 72 | | | 4,192 | 15 |
| Egypt..... | 4 | 3 | | | |
| Morocco..... | | 1 | | | |
| Portuguese Africa..... | 6 | | | | |
| Other Countries..... | 14 | 12 | 11 | 1,010 | 14 |
| Fiji..... | | | | 55 | |
| Totals..... | 3,229 | 619 | 430 | \$319,977 | 1,060 |

Another Varnish Maker Enters Field of Pyroxylin Automobile Finishes

Is claimed to yield higher gloss than other nitrocellulose systems. Undercoats are made from oxidizing oils, pigments and gums but are shorter than those ordinarily employed. Small nozzle and high pressure avoid "orange peel" effect.

ANOTHER varnish manufacturer, the Beckwith-Chandler Co., known for many years as furnishing finishing materials to the automotive industry, has developed a pyroxylin finishing system and has built a new plant in Newark, N. J., in which to produce the materials used in this system. The capacity of this plant is estimated at 2000 gal. per day.

While similar in most respects to other nitrocellulose systems, the Beckwith-Chandler system does not employ pyroxylin base undercoats and is claimed to yield a higher lustre. Both primer and filler coats consist of oxidizing oils with the usual pigment and gum constituents, although these materials are designed especially for use with pyroxylin finishing coats, and have their ingredients proportioned in such a way as to give them a degree of elasticity believed to be best suited for use under the relatively inelastic pyroxylin film.

Although the Beckwith-Chandler Co. is a comparatively new comer in the pyroxylin finish field, its products have been carefully developed by J. Alex Wilson, a chemist formerly with the DuPont and Duratex companies, and having long experience in the manufacture and application of pyroxylin coatings, especially those applied to fabric and leather. The finish now being manufactured also has been given many months of service and exposure tests as well as other tests calculated to insure proper flexibility and adhesion to metal surfaces.

In addition to the pigmented materials used in body finishing, which are to be known as "Neolite" finishing materials, this concern will manufacture a clear lacquer suitable for use on garnish rails and other parts to be finished in natural wood.

Final Polish Produces Gloss

In common with other pyroxylin finishes a final polish is required to secure as much gloss as is preferred by most purchasers. This gloss is obtained with a special Neolite polish with which it is claimed that one man can polish a large closed car body in about a half day. The finish thus secured is practically immune from scratching by dust or mud and is cleaned easily without washing and also without injury to the finish.

Particular care is used in the selection of the basic materials used in the manufacturer of Neolite finishes. The nitrated cotton is required to stand a test of 30 min. heating and 135 deg. C. without discoloration of litmus paper. The synthetic plasticizers employed do not include any vegetable oils, and are claimed to be not subject to mud spotting even with a mud containing alkali, while the solvents are those best suited to produce the desired results. This is said to insure greater stability and uniformity in the product.

One company among the large car manufacturers is reported to be using Neolite finishes in production work. It is used also in finishing bus bodies.

In the application of Neolite finishes the primer and surfacer coats can be brushed or sprayed on as desired. The succeeding (pyroxylin) coats, however, are sprayed on using any one of several standard makes of spray brushes. It is recommended that a nozzle with the finest opening procurable be employed, together with an air pressure of 100 lb. If with this pressure a solution having a gravity of 24 deg. Beaumé is employed it is claimed that an experienced operator can secure a finish with practically no pitted or orange peel appearance.

Less Elastic Primer Used

Primer purposely is used under Neolite made rather short, that is, less elastic than ordinary oxidizing oil primers. After application it is allowed to air dry for 24 hr. or force dry for 6 hr. at 150 deg. Fahr. When dry low spots in the surface to be finished can be filled if desired with Neolite knifing compound, but it is recommended that low spots be built up by applying several coats of surfacer rather than the single coating of knifing compound. If the latter is employed it should be air dried for 8 hr. or force dried for 2 hr. at 150 deg. Fahr.

Two grades of surfacer for use under Neolite are manufactured, one for sanding called the sanding surfacer and the second for rubbing with blocked pumice, called rubbing surfacer. Either of these can be brushed or sprayed on, after which they are allowed to air dry for 24 hr. or force dry for 6 hr. at 150 deg. Fahr.

Beckwith-Chandler chemists believe that undercoats made from oxidizing oils thoroughly dried are safer than pyroxylin undercoats.

It is necessary that the surface of the undercoats be prepared with the same care exercised in the use of high grade varnish work. When they are dried properly they are rubbed down with No. 240 speed grits or blocked pumice and water. If they are to be followed with blue, maroon, or other transparent coats they should be covered by a coat of Japan ground color or of Neolite ground color. This coat will air dry in two hours.

It is followed by a light coat of Neolite containing pigment of the desired color. This is sprayed on giving the air brush motion in a horizontal direction. It is followed immediately by a second, but much heavier Neolite coat, but in this case the air brush is moved in vertical strokes. The Neolite employed in the last mentioned coats, called the double header coats, is thinned with equal parts of Neolite thinner and is allowed to air dry over night.

It is important to use only Neolite thinner since the

solvents are suited especially for use with Neolite finishes. Alcohol and other cheap thinners available are not suitable and their use with this or other pyroxylin finishes is apt to result in precipitation of some constituents, bloom or other serious difficulty.

After the double header coats have dried over night, they are rubbed with No. 280 or 320 speed grits wet with Neolite rubbing solution. This will remove all orange peel appearance which may be present without scratching. Again, according to Beckwith-Chandler chemists, it is important to use only Neolite rubbing solution, as other rubbing materials are apt to kill the lustre and if any non-evaporating petroleum oil should be present in them the final coat of Neolite will not adhere and the job be ruined.

When rubbed to a surface equal to that on a first class varnish job, surplus rubbing solution is removed by wiping with a rag wet in naphtha and the job allowed to stand for an hour or two to insure complete evaporation of the naphtha. The final coat of Neolite then is sprayed on and allowed to air dry for four hours. If higher lustre is desired and the surface has a solid uniform color the final coat may consist of one part clear Neolite, one part pigmented Neolite and two parts Neolite thinner. Otherwise equal parts of pigmented Neolite and thinner are employed.

The final operation consists in polishing with Neolite polish applied with a soft cloth and rubbed until dry. This

polish contains the necessary abrasive and it is claimed that one man can polish a good size closed body in about half a day.

In addition to the Neolite finishes mentioned above, Beckwith-Chandler make a clear weather-proof pyroxylin lacquer which can be brushed or sprayed on garnish rails or other natural wood parts. They can furnish also a pyroxylin and a so called "ant leather" (long oil color varnish) striping material. The latter can be rubbed off after application if the striping makes a slip in the striping operation, while the pyroxylin stripe cannot owing to its slight solvent action on the coats under it.

While the polished Neolite gives an excellent gloss, a greater depth of lustre is securable by the addition of two coats of varnish. These are not considered to give greater durability to the finish and are more easily scratched and require more careful cleaning than final coats of Neolite. If they are desired, however, the final coat of Neolite is not polished, but is rubbed down with pumice stone and water and when dry is given a coat of Beckwith-Chandler hard drying body varnish which is air dried 24 hr. or force dried 4 hr. at 140 deg. Fahr. and then dried over night.

When dry, the first coat of varnish is mopped off and given a full coat of motorcar wearing body varnish or, for increased durability, a somewhat harder working varnish known as pale railway durable body varnish. In either case the final coat is allowed to air dry 24 hr.

New Earth Inductor Compass Used by Round the World Flyers

A NEW form of compass, known as an earth inductor compass, is being used by the American round-the-world flyers. It is the invention of Morris M. Titterington and is manufactured by the Pioneer Instrument Company of Brooklyn, N. Y., of which Mr. Titterington is chief engineer.

The ordinary magnetic compass, which consists of a number of pivotally supported magnetic needles is open to many objections when used on an airplane.

The Pioneer inductor compass also is based on the earth's magnetic field, but the element co-acting with this field can be placed at a point of the plane comparatively remote from the engine, where the disturbing influence is insignificant. This element consists of a coil which is rotated either by an air impeller or by an electric motor. The coil acts as a generator armature and

by cutting the earth's magnetic lines generates an electromotive force capable of producing an electric current. Current is taken off the coil by means of brushes and is conducted to an indicator (a voltmeter).

The brushes are arranged so they can be rotated around the armature or coil axis, and the voltage at the brushes depends upon their angular position relative to the direction of the earth's magnetic lines. The brushes are shifted by means of a controller mounted on the instrument board in front of the pilot.

This controller has the signs of the compass marked on its dial. In use the controller is rotated until its handle indicates the direction in which it is desired to fly and the plane is then steered until the meter indicates no current, which is an indication that the machine is headed in the desired direction.

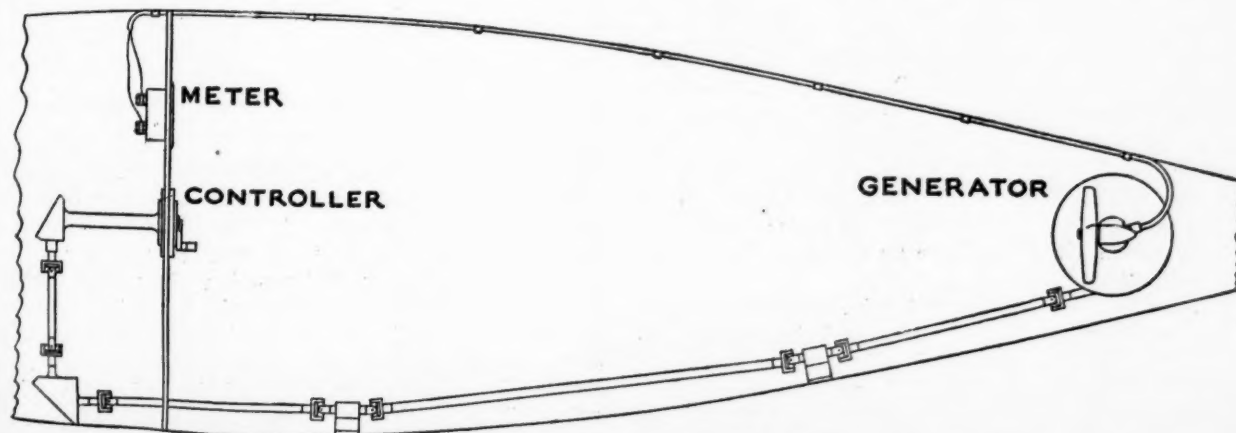
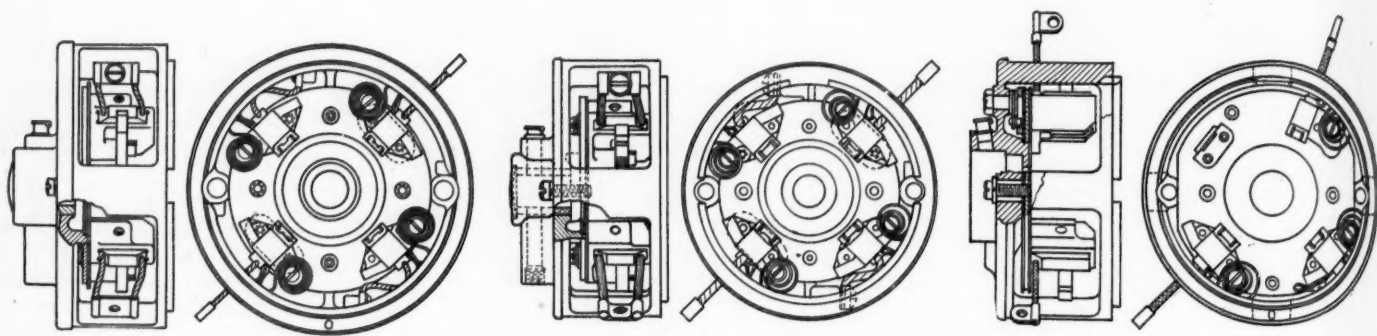


Diagram showing installation of Pioneer earth inductor compass on plane

New Electrical Equipment Line Designed for Higher Priced Cars

Generators and starting motors made with 4½, 5 and 5½ in. frame diameters. Head at commutator end is an aluminum casting. Third brush control and magnetic cutout employed. Closed circuit ignition system comprises interrupter, distributor and coil.

By P. M. Heldt



Commutator end head assemblies of De Jon generators and starter

COMPLETE electrical equipment for automobiles, including generators, starting motors, ignition coils, distributors and starting switches, is manufactured by the De Jon Electric Corp. of Poughkeepsie, N. Y. This equipment is not radical in design but conforms to good modern practice and is intended particularly for cars in the medium and higher priced classes.

Both the generators and the starting motors are made in three sizes—with field frame diameters of 4½, 5 and 5½ in. As far as the generators are concerned, the output rating is the same for all, 15 amp. at 8 volts when wound for 6-volt systems, but the larger size generators will not require as high speed as the smaller ones to generate the voltage necessary for charging and therefore will "cut in" at a lower engine speed. At the present time the 5½ in. generator is used for 12 volts only, though it can also be wound for 6-volt systems. The 5 in. generators are wound for either 6 or 12 volt systems while the 4½ in. are wound for 6-volt only.

The generator output above mentioned is obtained from the generators when cold. In setting this output the De Jon Electric Corp. was guided by the theory that it is not well to use a higher charging current than 15 amp. On the other hand, they have tried to make the cut-in speed as low as possible, so that even the driver who is limited to comparatively low speeds by traffic conditions a great deal of the time will have no difficulty in keeping his battery charged.

The cut-in speed of the 4½ and 5 in. generators when wound for 6-volt systems is 400 r.p.m. and that of the 5½ in. generator when wound for 12-volt systems the same. By lengthening the field frames it is possible to get materially lower cut-in speeds if desired, especially in the case of the larger diameter generators.

The field frames are made of welded steel tubing and

are machined all over in automatic lathes. Generators are made in either four-polar or bipolar form, though most of those turned out are of the former type, for which the cut-in speed is lower. The pole pieces are sawed off from a drawn bar of special section, with flanges to form pole tips, and the corners are then ground off so as to prevent injury to the insulation of the field coils.

Shafts of both the generators and the starters are made of alloy steel containing from 0.35 to 0.45 per cent of carbon. All surfaces that have to be close fits are ground. The armature core disks, which are made of a soft iron, are punched with slots for the armature conductors and are stacked on a spiral fixture so that the slots on the core twist around the axis, the object being to prevent humming at certain high speeds. The angle of twist is varied with the length of core and the number of slots, the aim being to make the circumferential advance in the length of the core equal to the combined width of one tooth and one slot. The shafts are forced into the disks under hydraulic pressure.

How Commutators Are Constructed

The commutators are built up of hard drawn copper bars with insulation of white mica between, the bars being assembled on a steel sleeve with coned-out head, a conical ring and a nut. At the conical surfaces insulation of amber mica is used, which is better adapted to stand the necessary deformation than the white mica. On all generator commutators the mica is undercut 0.020 in., the undercutting operation being performed by means of a special milling tool. The commutator seat on the shaft is knurled or serrated, and the commutator is forced onto this knurled section under pressure.

The commutator end head is an aluminum casting which is piloted in the frame ring. A dowel pin is provided in

the frame which fits in a hole in the head, its object being to line up brushes in respect to poles. At the driving end a cast iron plate is used, the form of which depends upon the style of mounting which it is intended to employ. In this connection it may be mentioned that the concern will make generators for any style of S.A.E. or special mounting. Frame, head and end plate are held together by means of two draw bolts.

How Oil Leakage from Bearings Is Prevented

In all designs the armature shaft is supported in two annular ball bearings, but if mounting conditions require it, a plain bearing is used at the driving end. The bearing at the driving end is locked endwise both on the shaft and in the plate, hence any end thrust is taken up on this bearing, while that at the commutator end is free to float longitudinally.

Particular attention has been paid to the problem of preventing oil from getting into the generator housing and onto the commutator. It will be noticed from the sectional view that the commutator end bearing is provided with a cap which closes it to the outside. On the inner side of the bearing there is a felt washer which tends to prevent oil from getting out of the bearing, but should some oil get through anyhow it will collect in the groove on the inner side of the felt washer and drain off through the hole provided for the purpose. There is an oiler with lid on the outside of the end head. At the driving end there are similar provisions for preventing oil getting into the generator.

Output control is by the third brush system. The armature winding being of the so-called series type, only two main brushes are used, and the third brush is arranged substantially opposite a point midway between these two. On the generators carbon-graphite brushes are used and are held in box type brush holders which are broached out so as to afford a good contact surface. The main brushholders are held by screws to a steel disk mounted on a

turned surface on the inner end of the bearing hub, a disk of Bakelite Dilecto being placed on each side of the steel disk. This brushholder supporting disk is held against angular displacement by means of screws in the end head.

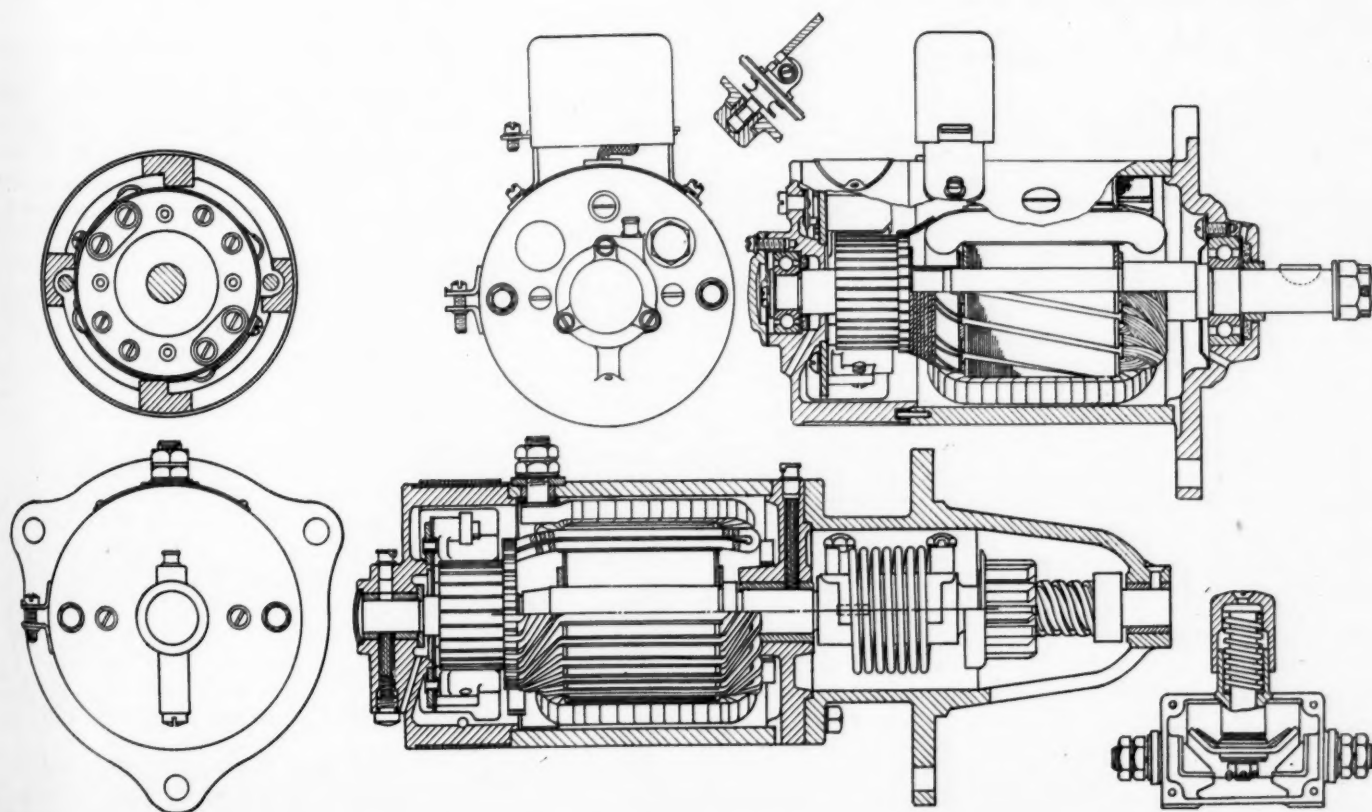
The third brush is mounted on an arc-shaped block of insulating material capable of angular displacement relative to the disk, this displacement being effected by means of a small crank, the shaft portion of which extends through the end cap and is provided with a slotted head, while the pin extends into an oblong slot in the block, thus forming virtually a Scotch yoke mechanism. Turning this crank by means of a screwdriver will displace the third brush relative to the two main brushes and the friction between the insulating block and the disk is sufficient to maintain the former in any position in which it is set.

The armatures are wound with enameled double cotton covered magnet wire, while the fields are wound with enameled single cotton covered wire. The armature coils are wound on forms and placed on the core, the wires being passed through the openings of the slots one at a time, and the slots are then closed by sticks of wood. The leads of the coils are soldered to the commutator bars and are held against the effects of centrifugal force by a cord wrapping.

Field Coils Varnished and Baked

Both the armatures and the field coils have their insulation improved by being varnished and baked. The parts are preheated, dipped in clear insulating varnish and baked at 250 deg. Fahr. for eight hours; they are then redipped and baked again for eight hours.

One end of the field winding is connected to a third brushholder while the other end is grounded to the frame through a fuse. The arrangement of the fuse and the ground connection is clearly shown in the detail view shown together with the generator section. The end of the field lead fastens to a clip riveted to the brushholder disk. A cap with hexagon head screws into the end head



Sectional assembly views of De-Jon generator, starter and starter switch

at this point, the cap containing the fuse, which is forced into contact with the clip as the cap is screwed home. Automobile generators with third brush control generally have a fuse inserted in the field circuit, which will blow if the connection to the battery becomes loosened and thus protect the lamps against excessive voltage.

The field frames and all castings are enameled and baked. Certain sections of the frame are protected during the enameling process by shields, these serving for grounding the frame on the engine. Throughout the assembling process the frames are protected by a paper jacket so that the finish is not marred.

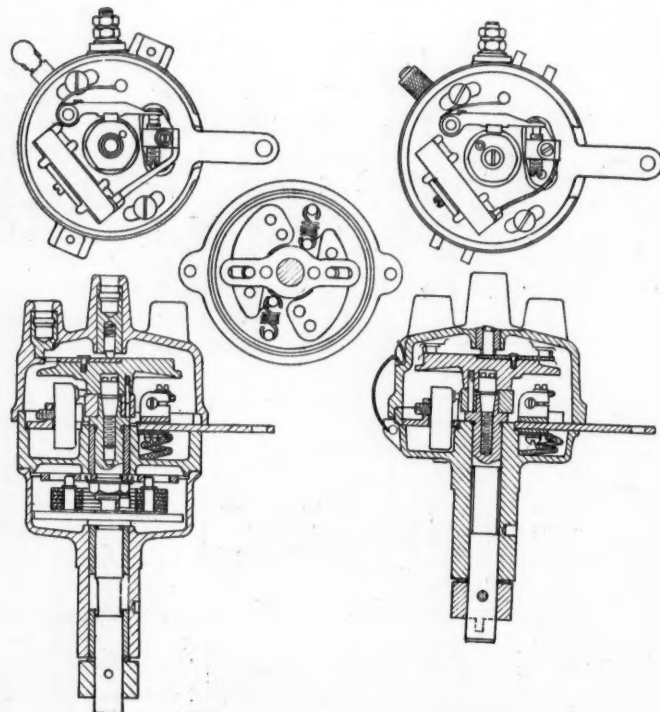
A battery cut-out of the familiar magnetic type, with both shunt and series coils, is fastened to the top of the generator frame by means of screws. There are inspection openings in the end cap at the commutator end and accessibility has been aimed at throughout in the design.

Starter and Generator Design Similar

The starting motors resemble the generators in many respects. The fields have coils wound of copper bars and these coils are insulated by means of a half-lap wrapping of cotton tape, this same form of wrapping being used for the generator field coils. The armature coils consist of single turns of bare copper bar placed in open slots, and to hold them in position against centrifugal force a rolling process is applied to the core after the coils are in place, by which the metal of the core on opposite sides of the slot is forced over the coil to hold it tightly.

The starter armatures have a series winding and four brushes are used on the commutator. The brushholders are similar to those used on the generators, but in view of the much heavier currents to be carried the brushes are made of a metallic composition and provided with heavy "pig-tails" of stranded copper wire connecting them to the brushholders. Plain bronze bushed bearings are used on the starters and are provided with wick oilers to which oil can be fed through oil holes on top of the bearing hubs, provided with lids. Substantially the same provisions against the ingress of oil are made as in the generator.

Starters are rated in accordance with the practice rec-



De Jon braker and timer mechanism: left, automatic advance type; right, hand advance type

ommended by the Electrical Equipment Manufacturers' Association. The $4\frac{1}{2}$ A. starter has a stalling torque of 14.5 lb.-ft. on a 6-volt battery of 100 amp.-hr. capacity, the actual voltage at the starter terminals in that case being 3, as $\frac{1}{2}$ volt drop must be allowed for every 100 amp. draw. The 5 in. starter on a 12-volt battery has a stalling torque of 28 lb.-ft. These starters are designed for any S.A.E. or special mounting and any form of drive.

A sectional view is shown herewith of the starter switch. The housing is an aluminum casting open on both sides. There are two triangular prismatic stationary contacts of copper, with integral threaded studs, which can be fastened either into the ends or the bottom of the housing, as best suits the wiring scheme. A movable contact of heavy plate copper, backed up by a plate of spring steel, is carried by a spring plunger which is screwed into an aluminum cap serving as the starter switch foot button. The starter switch is preferably mounted on the chassis so the starter button extends up through the footboards.

The ignition outfit made by the De Jon Electrical Corp. is of the closed circuit type and comprises a combined interrupter and distributor and a coil. Referring to the sectional view of the latter, this shows the horizontal type, while the coil is also made in a vertical type. The bases of both are made of aluminum while the heads are of molded Bakelite.

The core is made of laminations of silicon steel which are stacked in a triangular formation, allowing a clamping bolt for the whole coil assembly to pass through the center. By means of silicon steel disks at the ends of the core—provided with one radial slot each to eliminate eddy currents—and a sheet of silicon steel over the secondary, the magnetic circuit is practically closed, but the return portion of the circuit is of much less magnetic capacity than the core inside the coil. If this were not the case the coil would have too much lag. Silicon steel (which is very brittle) is used for the core because it causes less loss from both eddy currents and hysteresis than other steels. The core plates are varnished to reduce eddy current losses.

The primary winding is wound on a tube of insulating material containing the core, and the secondary is wound on another tube that passes over the primary. Fiber end caps which are preheated and have two coats of insulating varnish applied to them are forced over the ends of the secondary. Previous to this, however, the secondary coil is dipped in insulating varnish to seal up the ends and is then baked.

Details of Coil Construction

While the primary winding is of enameled single silk covered wire, the secondary winding is of enameled wire wound on oiled paper. In sealing up the ends by dipping, care is taken not to get any of the varnish into the coil proper, as that would make it difficult to remove the solvent.

Connected in series with the primary winding is a ballast coil of nickel wire wound on a mica core. The object of this coil is to equalize the current consumption at high and low engine speeds and to cut down the current draw if the engine is accidentally stalled without the ignition switch being opened. There are two primary terminals on the Bakelite cap of the coil, connection from one being made to the interrupter and from the other to the battery. One end of the secondary coil is grounded while the other connects to a terminal on the cylindrical housing of the coil.

Cork washers are placed over the ends of the coil to take up any slight differences in length of same and the Bakelite caps are then drawn up tight against the coil and the inclosing tube by means of the central draw bolt.

The condenser is mounted on the ignition unit. It is made of paper and tin foil, in the rolled form, and after being impregnated is pressed flat. Each condenser is subjected to both a soaking test and a dielectric test. In the soaking test it is subjected to a high d.c. potential for 20 minutes, with the result that if any moisture is present it vaporizes and then reveals itself in a very impressive manner. In the dielectric strength test the coil is subjected to a high a.c. potential, which will break down the insulation if it is not sufficiently high to readily withstand the working strains.

All condensers are assembled in a metal box and are held under pressure, hence there is no chance for the layers of tinfoil to separate in use and for the condenser thus to lose capacity.

Details of the Interrupter

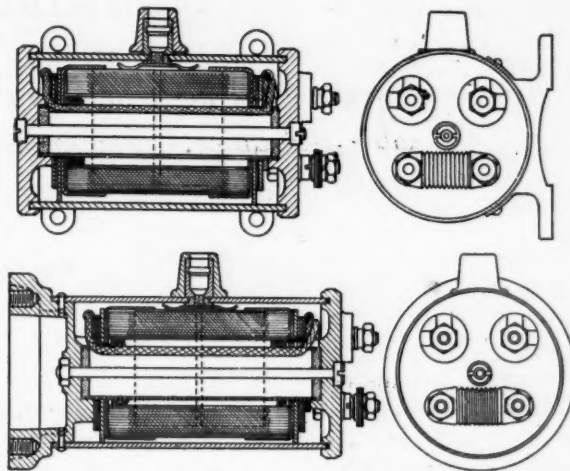
The working parts of the interrupter are mounted on what is known as the breaker plate and not on the interrupter housing, which latter is an aluminum casting. This plate carries the condenser, adjusting screw, and breaker bar. The adjusting screw is carried in an aluminum bracket. The breaker plate, which is a steel stamping white nicked, is formed with an arm projecting through a slot in the housing, by means of which the ignition is timed. No special wrenches or tools are required for making adjustments or dismantling the complete disk.

On the top of the interrupter is the distributor, which consists of a Bakelite disk mounted on the end of the distributor shaft and fitted with a distributor arm of monel metal. The secondary terminal points are molded into the Bakelite cap of the distributor. The distributor disk is piloted on the cam-adjusting screw and driven through a pin set off center in the cam.

Ignition units are furnished both in the hand-controlled and the automatic type. The latter type has a governor of the centrifugal type which is mounted in the lower part

of the housing. The governor weights consist of steel stampings which are riveted together. These weights are drawn toward the axis of rotation by coiled springs, and pins fastened into their sides extend into slots in the timer arm, which latter is connected to the breaker disk.

The De Jon Electric Corp. does not make any lighting



Sectional views of De Jon ignition coil assemblies

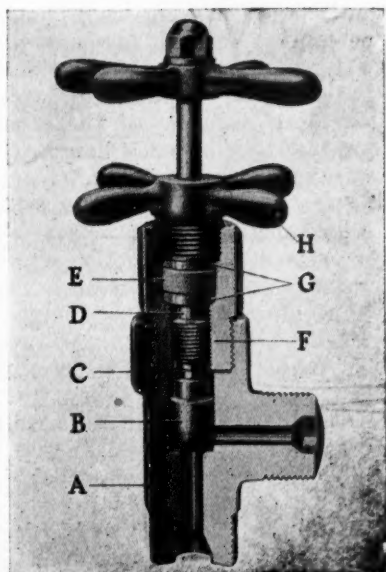
and ignition switches itself, but is prepared to furnish such switches of reputable make.

Distributors have been appointed in a large number of the more important cities and they carry complete stocks of parts at all times. These distributing stations are so distributed over the country that it need not take more than 24 hours to get parts, no matter what part of the country they may be required in. Service stations will be established throughout the country. The system has been on the market for about a year and is now standard equipment on two well known makes of car.

Design Special Valve for Oxygen Welding Manifold

THE design of a valve for oxygen manifolds, which must necessarily carry high pressures, has always involved difficulties, but the Oxweld Acetylene Co. of New York now have developed a valve for which they claim that it meets all requirements. It has a swivel tip on the stem. The cross sectional illustration herewith shows the details of its construction and its operation.

The body A has a formed seat carrying the stem tip B. This tip is attached to and is carried by the stem D, by means of a



Oxweld valve for oxygen manifolds

swivel joint. Thus the tip is enabled to find its natural seat in the body. The stem screw is in the inner end of the stuffing box F, which is made gas-tight by means of a lead gasket C. The stem itself is made gas-tight by means of a rubber packing E which is compressed between packing rings G by means of the hand wheel and nut H.

It is claimed for this valve that it is fool-proof, for if the operator should happen to unscrew the hand wheel all the way there is no possibility of the internal parts being blown out by pressure, because the stem screws into the stuffing box. Even if both the stem and the hand wheel should be unscrewed, the parts could not come out, because the larger end of the stem would lodge against the inner end of the stuffing box.

IN addition to import duties in Denmark, a special tax has been imposed on passenger cars for the period of one year, ending Feb. 1, 1925, which adds about 30 per cent to the retail price.

In Mr. Jacobson's story on markets in Denmark and Norway, published July 31, the normal value of the Danish krone should have read 26.28 cents and the present value about 16 cents.

General Increase in Discounts Is Unlikely, Manufacturers Say

Prices would have to go up and dealers would not relish added sales resistance. Temporary allowances for specific purposes made in some cases. Number of retailers not going to be cut.

By D. M. McDonald

REPORTS of radical changes in distributing methods and in general merchandising policies by leading companies in the automotive industry seem to be inaccurate for the most part. Rumors about reduction of dealer organizations, raising of discounts and replacing distributors by branches all have been current in the last few weeks. Investigation reveals that much of the talk has had little foundation in fact, although many companies are planning constructive improvements in marketing methods.

Reports have been numerous of gradual cuts by factories in the number of dealers at various points. Sales executives of the factories in question and other familiar with the merchandising situation say that it is inconceivable that any such action would be taken by any factory. The neighborhood dealer is an economic necessity, they believe, and has come to stay.

Another report that distributors gradually will be replaced by factory branches in several important instances has been checked back with officials and found to be equally groundless.

Furthermore the report that factories generally are allowing higher discount rates to dealers has been discounted to some extent. Some factories did increase discounts during the period of closing out old models, others have raised them during the off-season period preparatory to bringing out new models. There are not, however, sufficient grounds now for declaring that discounts have been increased generally, that they are likely to be or that those increased thus far will remain at their present high level.

There has not been and is not likely to be a general increase in discounts for the reason that such action would involve higher list prices on cars. Distributors and dealers generally do not want the sales resistance always set up by higher prices.

The subject of higher discounts has been taken up at practically every factory-dealer-distributor convention that has been held recently. It is certain to be discussed at similar gatherings in the next few months. Officials of two leading companies admit that it was taken up at their sales meetings and that it was a main topic of

ARE dealer discounts likely to go up? Is the number of sub-dealers going to be cut? Which is the more efficient, branches or distributors?

These three questions are being given close attention in many manufacturing plants today. Rumors of contemplated changes in merchandising policies have been numerous in recent weeks. This story tells what the situation really is and is based on interviews with important factory executives.

of a number of discussions.

Both of these companies were bringing out new models which would differ considerably from former models and on which it was possible to fix any price within reason that sales expediency might dictate. Distributors at each of these conventions were told that they could have higher discounts if they wanted them, but that higher prices would have to accompany such increases.

One of these conventions voted almost unanimously to keep discounts where they are and to hold the car price as low as possible. Action at the other meeting resulted in a rearrangement of the discount scale whereby dealers selling a minimum ratio of cars would get a slightly higher discount, but the sliding scale for those selling the higher ratios was left exactly as before.

The net effect of this latter action is to protect dealers so that they have a better chance to make some money if business falls off to such an extent that they cannot reach the higher quotas. If they continue to sell about the same number of cars as in the past, and most of them hope to, they will net the same profit as previously.

The action of these conventions on discounts shows the situation as it actually is in two of the largest producing companies. Officials of these companies state, furthermore, that they have not heard of any competing organizations in their price class offering higher discounts.

Several companies have increased discounts recently to offset competitive conditions arising from new models or greater popularity of other cars in the same price class. In practically every instance these increased discounts have been accompanied by increased list prices. Whether or not the higher discounts will continue when new models are introduced cannot be determined now. If they are continued, it is certain they will be encompassed in the price of the car. As in the case of the two factory conventions already referred to, the discount will be decided at the time the new model is announced, contract provisions permitting.

Where the discounts and prices have been increased, without the introduction of new models, it may safely be considered that the additional discount is principally to provide an increased trading allowance or some other

form of bonus or price reduction to move cars. There is, however, an important exception to this conclusion. That is the action of the manufacturer who is not essentially in the heavy production group, because the manufacturer not seeking quantity output is not as keenly affected by the resistance accompanying price increases.

As to manufacturers reducing the number of dealers and widening the territory for the remainder—there is only one answer to that. Probably there are not more than two or three manufacturing companies, certainly not more than six, which wouldn't take every dealer they could get as fast as the other fellows let them go. Every company is holding to every dealer it can and far too many retailers to please are changing lines or going out of business. The only factories which are not seeking new dealers, or will not seek them, will be those whose production already is insufficient to meet the demand in normal times of the dealers at present on their list.

The theory of the factory in this connection is that the more dealers you have, the more credit there is available.

Dealers who have enough credit to operate several branches certainly will be permitted to do so. They always have been.

Some replacement of distributors by factory branches is taking place in several companies at different points in the country, but purely as a matter of expediency. Changes from distributor to branch today usually are made only when the distributor is considered inefficient or when he goes out of business or changes his line.

The switch from distributor to branch is particularly efficacious to the factory at a time when cars are moving slowly, because it permits of centralized control, increased discounts to dealers operating under the branch, and therefore, increased trading allowances generally.

There is nothing to indicate, however, that any factory desires now to replace any distributor with a factory branch unless the distributor is unsatisfactory. Furthermore there is nothing to indicate that any factory would not replace a distributor with another distributor if it can get a good one.

New Universal Joint Has Uniform Motion in All Positions

ONE fault of the ordinary universal joint, whose members rock around two axes at right angles to each other, is that when the driving and driven shafts are not in line, the motion of the driving shaft is not transmitted uniformly, but, on the contrary, if the driving shaft rotates at uniform speed the driven shaft rotates at a periodic variable speed, the variations depending upon the angle between the two connected shafts.

This variation in the speed relation between driving and driven shafts is a matter of considerable moment if the connected shafts carry (or are in direct driving relation with) parts of considerable inertia, because it is obvious that in that case each of the connected parts must be periodically accelerated and decelerated, and this action will subject the parts connecting the inertia masses to heavy stress, which stress is superimposed upon that due to the transmission of power.

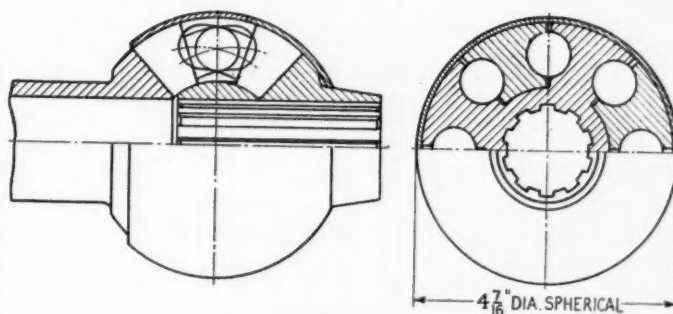
Carl W. Weiss of the Weiss Engineering Corp., of Newark, N. J., has designed a universal joint in which the transmission of motion from the driving to the driven member is uniform. It consists of driving and driven members in the form of spherical sectors, in the faces of which slots are cut, the lands on one sector entering the slots on the other. In the faces of the lands are milled curved slots of substantially semi-circular cross section, the center lines of these slots forming arcs of circles whose center lies on the axis of the joint member only a short distance from the center point of the complete joint, which is defined by a spherical guide surface on one member and spherical outer surfaces on both. Steel balls are lodged in the slots in opposing faces and the driving torque is transmitted from the driving member to the driven one through these balls.

It is evident that when the two connected shafts are in line with each other all of the steel balls will lie with their centers in a common plane, which is at right angles to the common axis of the driving and driven shafts. If one shaft is moved to make an angle with the other the plane of the balls will shift so as to make with the axis of each shaft an angle equal to one-half that between the two shafts.

That there is uniformity of motion transmission under these conditions is demonstrated by means of a testing or demonstrating device comprising large scales of circu-

lar measure and long pointers on both the driving and driven shafts. With this device it can be shown that, no matter what the angle between the two shafts, if the driving shaft is moved through a certain angle the driven shaft always turns through the same angle.

This property should make the joint of considerable advantage wherever it is impossible or undesirable to use more than one universal joint between connected shafts carrying (or in direct driving relation with) considerable inertia masses, as the use of such a joint should greatly reduce the strains in the connecting members.



Sectional views of Weiss universal joint. Designed for a passenger car of 453 cu. in. piston displacement

In the joints designed for automobile drives there are eight steel balls, of which four take the pressure due to the torque during forward drive and four during reverse drive. The motion between the balls on the one hand and the driving and driven members on the other, is a rolling motion, instead of plain sliding motion, and this should reduce the frictional losses in the joint.

It is claimed that a joint of this type of given outside diameter has considerably more torque capacity than a joint of the usual yoke or ring type of the same diameter, and that, inversely, the Weiss type of joint, if designed for transmitting the same torque, is of smaller diameter. The whole joint is inclosed in a housing of thin sheet metal in case it is to be mounted inside a ball housing at the rear of the transmission case, or in an oil-tight housing if not so mounted. We understand that joints of this design are being tested out by a number of manufacturers.

How Air Trapping Is Prevented in Steam Cooling System Radiators

With conventional arrangement, lesser heat dissipation from side tubes causes them to be overtaxed before center parts are utilized fully. Aim is to make flow proportional to condensing capacity.

A SERIES of patents have been granted to S. W. Rushmore on improvements in radiator design intended primarily to prevent the trapping of air in radiators used in so-called steam or evaporative cooling systems. Readers who have followed the development of such systems are aware that one of the problems involved in their successful operation is that of preventing the radiator from becoming air bound and thus keeping steam from reaching all the condensing surface of the radiator.

In the Rushmore system, described in these columns under date of May 26, 1921, it will be recalled that water circulated through the cylinder jackets, together with the steam formed in the jackets, is returned, not to the top of the radiator, but to a point in the lower radiator tank just above the water level in said tank. There the steam and water separate, the latter rising into the radiator tubes, where it is condensed, the condensate returning by gravity to the tank. Thus the radiator constitutes an up-flow condenser.

For the successful operation of a steam system it is necessary to provide means whereby air which is likely to be in the radiator when the engine is started is displaced. Otherwise the steam can reach only a part of the

condensing surface. In the Rushmore system the pressure of the steam rising in the radiator forces the air out through a non-return valve with a light spring set for one or two pounds pressure, this valve being in the vent pipe at the top of the upper tank.

Contrary to the general impression, a steam system of this type seldom operates with a pressure above atmosphere in the radiator. Once the air is expelled and the condensing space is free for entrance of steam, the pressure is more frequently below than above atmosphere for the reason that, under most conditions, the condensing capacity of the core exceeds the steam generating capacity of the cylinder jackets.

No Steam Blow-off at End of Hard Run

In fact, the Rushmore system could be left open to the atmosphere and would operate satisfactorily without any blow-off valve. The sole purpose of this valve is to prevent steam from blowing off when the engine is stopped after a hard run. When this occurs the residual heat in the engine makes a little steam which, with no fan running and the condenser in consequence having no cooling medium circulating through it, would escape in a cloud which might alarm one not familiar with the system, though of no real consequence. In effect the radiator can be considered as a simple water economizer which merely condenses the steam formed and returns it to the system.

Experiments with radiators of the ordinary type used in water cooling systems, however, were found to give, under certain conditions, unsatisfactory results when applied without modification to the Rushmore system, due to the fact that, long before the quantity of steam generated is great enough to tax the capacity of the radiator as a whole, the lesser cooling capacity of the tubes at the sides and not in the direct draft of the fan were overtaxed. In consequence, steam would pass through the side tubes and partially fill the top tank before it rose more than a short distance in the well cooled center tubes over which the air blast induced by the fan is a maximum. This would result in trapping air in the central portion of the radiator core due to the fact that the air is considerably heavier than the steam. Steam rising in the central tubes can push the air upward only a limited distance, due to the fact that, under the conditions in question, it is condensed before it has reached a height equal to a fraction of the length of the tube.

The patents in question cover various methods of preventing such air trapping by the simple expedient of proportioning or arranging the steam passages in a way such that steam will flow through them at a rate at which it will reach the top of the core in all tubes at approximately the same time. In other words, the flow is made approximately proportional to condensing capacity by varying the resistance to flow in different tubes, and steam is prevented from reaching the central tubes except from below.

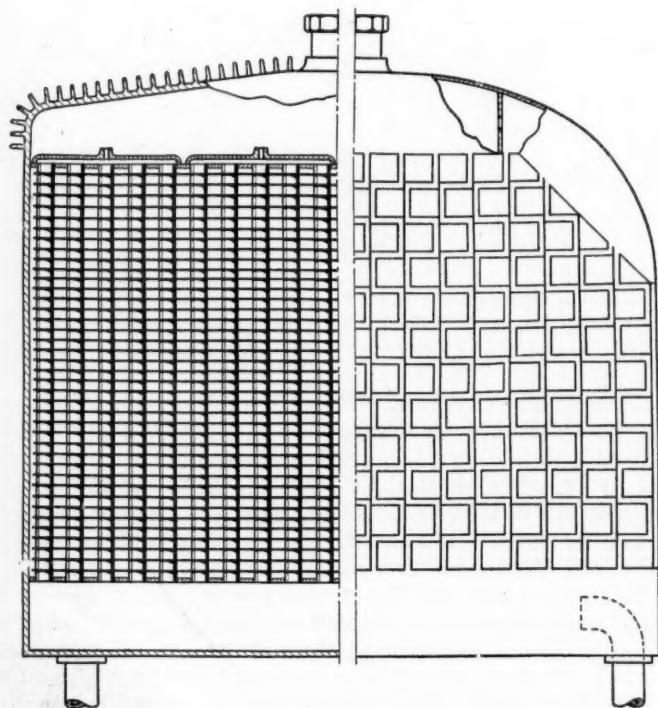


Diagram illustrating two of the methods patented by S. W. Rushmore for preventing air trapping in radiator core. At left a water tube type with groups of tubes capped with plates each of which has an air vent hole. At right a partition in top tank with similar hole for same purpose

This is accomplished by varying the size of the steam spaces, their length, or the number of bends in them, or by the use of baffles (especially in the air tube cellular type of core) or vents of different size. In practice it has not been found necessary to vary or control separately each tube or steam passage. With the water tube core, for example, a number of tubes are capped with a plate having a single vent hole or similar vents are placed in partitions in the top tank, as shown in the accompanying cut. These vents are proportioned in such a way that they control the flow from various groups of tubes in the desired fashion. They can, of course, be made of sufficient size to prevent their becoming blocked, especially as

they handle only air and steam except on the rare occasions when the system requires refilling.

Another of the group of patents in question covers a construction in which the size of air and steam passages is varied from top to bottom of the radiator. This refers especially to an air tube cellular type of core wherein the bore of the transverse horizontal air tubes is decreased and the water space correspondingly increased from top to bottom. Since the steam is condensed as it rises, less space is required between air tubes toward the top of the radiator. Consequently the bore of the tubes can be increased, and the radiating capacity increased without increased frontal area.

New Gear Shifter Assembly Constructed of Pressed Steel Parts

USE of a shifter assembly constructed entirely of pressed steel parts instead of the conventional rod and fork design has enabled the Detroit Gear & Machine Co. to effect important manufacturing economies in the production of its new model KL gearset. The new unit, which provides three speeds forward and reverse, is designed to transmit a torque of about 160 lb. ft.

The shifter assembly is carried by the slotted plate shown in Fig. 1. This plate fits between the gearcase and its cover, and is held in position by cap screws at each corner. The H-slot at the center of this plate is for the guidance of the lower end of the shifter rod, while the longer slots on either side serve as guides for the shifter arm assemblies. Each of the latter consists of two steel stampings, which are fastened together by two rivets that pass through bars which fit snugly in the guides in the slotted plate. As shown in Fig. 2, the lower stamping is bent at right angles to form an arm which registers with the collar on the sliding gear. On one side of it there is a rectangular notch. A similar notch is provided directly above it in the upper stamping which latter slides on the top of the slotted plate. Interlocking is secured by two ball and spring assemblies, one for each shifter arm assembly, which are contained in spun housings on each side of the slotted plate. The balls register with depressions in the bottom of the upper stamping of the shifter arm assembly.

Gears are arranged for the standard S. A. E. shift.

When the driver throws the shifter rod to the right or the left, its lower end enters the rectangular notch in one or the other of the shifter arm assemblies. Forward or backward motion of the shifter rod then throws the gears for the various speeds into mesh in the conventional manner.

Another feature of the gearset is the use of 7-pitch gears to secure quieter operation. The constant mesh set has this pitch as have the countershaft second-speed gear and the second and high sliding gear. The countershaft low-speed and reverse gears, the reverse idler and the low and reverse sliding gear are all of the conventional 7-9 pitch.

The cast iron housing of the gearset is designed to fit a standard S. A. E. bell housing. The gears, which are of Uma alloy steel, are all burnished against master burnishing gears before hardening. Both main and countershafts are S. A. E. No. 2320 steel, hardened and ground.

Reductions provided are 3.11 to 1 in low, 1.69 to 1 in second, 1 to 1 in third, and 3.76 to 1 in reverse. The constant mesh gears have a face width of 23/32 in., while the low, second and reverse gears have face widths of 13/16, 7/8 and 3/4 in. respectively. The main shaft is carried in ball and the countershaft in Hyatt roller bearings. The clutch pilot bearing also is a Hyatt. The distance between the center lines of the two shafts is 3.357 in. The direct drive clutch is a gear tooth type.

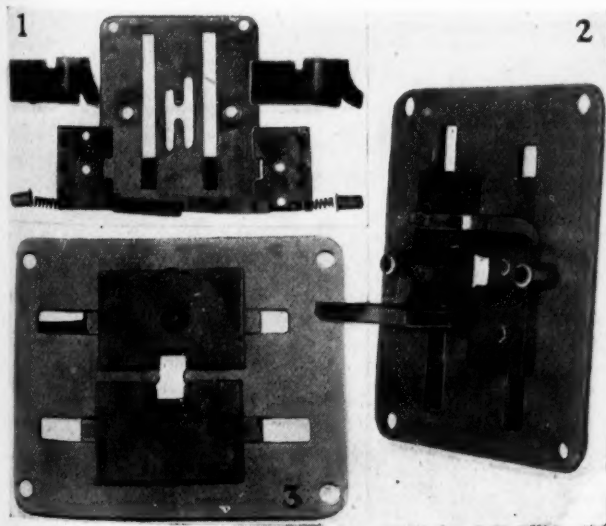
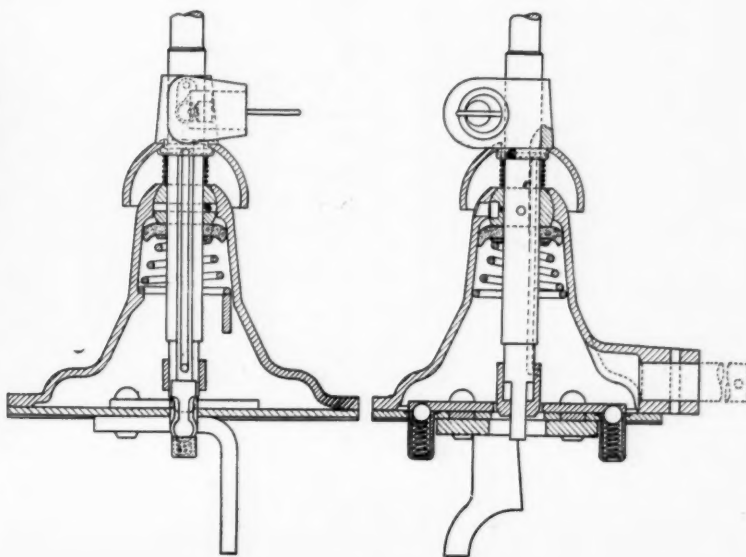


Fig. 1—Parts used in new Detroit Gear & Machine Co. pressed steel gear shifter assembly. Fig. 2—Top view of assembly. Fig. 3—Bottom view of same produced by Detroit Gear & Machine Co.



Sectional drawings of pressed steel shifter assembly

Exports of Cars, Trucks

| COUNTRIES | GASOLINE PASSENGER CARS | | | | | | | | GASOLINE TRUCKS | | | | | |
|--------------------------------|-------------------------|--------------------|----------------|--------------------|------------------|--------------------|--------------|------------------|-------------------|------------------|--------------|------------------|--------------|------------------|
| | Up to \$500 | | \$500 to \$800 | | \$800 to \$2,000 | | Over \$2,000 | | Up to 1 ton incl. | | 1 to 2½ tons | | Over 2½ tons | |
| | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value |
| Europe | | | | | | | | | | | | | | |
| Austria | | | 1 | \$690 | 1 | \$991 | | | 1 | \$408 | | | | |
| Azores and Madeira Islands | 10 | \$4,599 | 60 | 43,686 | 55 | 71,138 | 1 | \$2,500 | | | | | | |
| Belgium | 15 | 7,290 | | | | | | | | | | | | |
| Bulgaria | | | 1 | 844 | 2 | 1,989 | | | | | | | | |
| Czechoslovakia | | | 15 | 11,784 | 28 | 40,330 | 3 | 11,876 | | | 1 | \$1,757 | | |
| Denmark | 17 | 6,771 | | | | | | | | | | | | |
| Estonia | | | 1 | 800 | 21 | 23,380 | 1 | 4,000 | 1 | 1,182 | | | | |
| Finland | 14 | 6,438 | 1 | 721 | | | 8 | 19,900 | 3 | 1,224 | | | | |
| France | 16 | 5,240 | | | | | 5 | 13,036 | 1 | 920 | | | | |
| Germany | | | 20 | 15,720 | 11 | 12,343 | 2 | 8,400 | 1 | 407 | | | | |
| Greece | 25 | 11,495 | | | 1 | 1,406 | | | | | | | | |
| Hungary | | | | | | | | | | | | | | |
| Iceland and Faroe Island | | | | | | | | | | | | | | |
| Italy | 100 | 28,991 | | | 1 | 900 | | | 300 | 78,310 | | | | |
| Latvia | | | | | 3 | 4,132 | | | | | | | | |
| Lithuania | | | | | 1 | 1,932 | | | | | | | | |
| Malta, Gozo and Cyprus | 6 | 2,184 | 2 | 1,661 | 4 | 4,299 | | | | | | | | |
| Netherlands | 19 | 9,180 | 26 | 20,720 | 68 | 89,719 | 16 | 52,369 | 4 | 4,190 | 1 | 1,572 | | |
| Norway | | | 13 | 9,502 | 2 | 1,712 | | | | | | | 2 | \$3,500 |
| Poland and Danzig | | 521 | | | 6 | 6,636 | | | | | | | | |
| Portugal | 12 | 4,569 | 1 | 794 | 19 | 21,698 | | | | | | | | |
| Rumania | 6 | 2,748 | | | 5 | 7,666 | | | | | 1 | 500 | | |
| Russia | | | | | 61 | 80,786 | 23 | 60,016 | 168 | 50,205 | 6 | 6,536 | | |
| Spain | 218 | 99,862 | 75 | 56,891 | 83 | 96,284 | 6 | 16,431 | | | 6 | 6,984 | | |
| Sweden | 18 | 7,893 | 19 | 12,765 | 38 | 56,398 | 4 | 11,315 | | | | | | |
| Switzerland | 2 | 994 | | | 1 | 1,961 | | | | | | | | |
| Turkey | | | 68 | 43,817 | 40 | 51,717 | 18 | 58,235 | 55 | 33,560 | 37 | 41,683 | | |
| England | 5 | 1,589 | 34 | 19,771 | 15 | 13,950 | 1 | 3,500 | 4 | 2,212 | 1 | 1,843 | | |
| Scotland | | | | | | | | | | | | | | |
| Ireland | 1 | 75 | | | | | | | | | | | | |
| Yugoslavia, Albania and Fiume | 3 | 1,438 | 1 | 861 | 1 | 1,332 | | | | | | | | |
| North and South America | | | | | | | | | | | | | | |
| Canada | 218 | 55,970 | 117 | 80,592 | 344 | 403,028 | 33 | 87,084 | 30 | 25,394 | 55 | 82,815 | 13 | 30,042 |
| British Honduras | 1 | 354 | 1 | 800 | | | | | | | | | | |
| Costa Rica | 5 | 2,174 | | | 12 | 12,537 | | | | | | | | |
| Guatemala | | | 15 | 11,077 | 16 | 16,927 | | | | | | | | |
| Honduras | 8 | 2,547 | 2 | 1,419 | | | | | 5 | 1,692 | 1 | 907 | | |
| Nicaragua | | | 2 | 1,602 | 1 | 903 | | | | | | | | |
| Panama | 8 | 3,510 | 5 | 4,749 | 10 | 12,062 | | | 8 | 4,817 | 1 | 1,313 | 1 | 3,550 |
| Salvador | 11 | 5,150 | 4 | 3,125 | 13 | 17,713 | | | | | | | 3 | 16,667 |
| Mexico | 467 | 151,922 | 129 | 91,837 | 134 | 134,827 | 19 | 63,313 | 63 | 24,979 | 26 | 38,366 | 3 | 8,320 |
| Newfoundland and Labrador | 6 | 2,436 | 5 | 3,879 | | | | | 2 | 300 | 2 | 1,936 | | |
| Barbados | 6 | 2,508 | | | 2 | 2,256 | | | 2 | 712 | | | | |
| Jamaica | 4 | 1,885 | 7 | 4,798 | 6 | 6,482 | | | 13 | 6,086 | | | | |
| Trinidad and Tobago | 6 | 2,750 | 1 | 707 | 2 | 1,739 | | | 5 | 1,780 | | | | |
| Other British West Indies | 6 | 1,936 | | | | | | | 3 | 812 | | | | |
| Cuba | 400 | 123,348 | 67 | 42,314 | 52 | 56,453 | 15 | 41,516 | 78 | 18,207 | 10 | 11,365 | 3 | 12,000 |
| Dominican Republic | 28 | 10,097 | 6 | 4,579 | 18 | 21,689 | 7 | 18,747 | 4 | 1,958 | 2 | 6,010 | 2 | 5,904 |
| Dutch West Indies | | | 3 | 2,033 | | | | | 5 | 1,780 | | | | |
| French West Indies | | | | | | | | | | | | | | |
| Haiti | 9 | 3,913 | 5 | 3,951 | 5 | 4,559 | | | 1 | 356 | 2 | 2,606 | | |
| Virgin Islands | 1 | 260 | | | | | | | | | | | | |
| Argentina | 84 | 38,352 | 111 | 80,999 | 78 | 94,723 | 25 | 81,686 | | | 12 | 22,617 | 8 | 31,017 |
| Bolivia | | | 5 | 4,145 | 17 | 21,655 | | | | | | | | |
| Brazil | 209 | 73,125 | 131 | 97,901 | 190 | 197,225 | 16 | 47,412 | 325 | 86,588 | 2 | 2,362 | | |
| Chile | | | 4 | 2,986 | 13 | 13,976 | 10 | 29,311 | 9 | 10,389 | 28 | 43,978 | 4 | 9,861 |
| Colombia | 18 | 7,068 | 5 | 3,479 | 32 | 37,139 | 1 | 2,746 | 22 | 8,084 | 11 | 25,343 | 1 | 2,191 |
| Ecuador | 15 | 5,408 | 4 | 2,446 | 10 | 12,402 | | | 18 | 6,600 | 1 | 1,125 | | |
| British Guiana | | | | | 1 | 1,125 | | | | | | | | |
| Dutch Guiana | 1 | 300 | | | | | | | | | | | | |
| Paraguay | | | | | | | | | | | | | | |
| Peru | 15 | 5,749 | 83 | 63,799 | 44 | 49,405 | 2 | 8,343 | 42 | 21,379 | 59 | 65,531 | 1 | 4,110 |
| Uruguay | 418 | 130,483 | 48 | 34,725 | 17 | 21,133 | 5 | 14,342 | 66 | 19,934 | | | | |
| Venezuela | 29 | 10,556 | 18 | 12,234 | 15 | 16,000 | 4 | 11,902 | 21 | 9,284 | 21 | 28,472 | 2 | 10,770 |
| Asia | | | | | | | | | | | | | | |
| Aden | | | | | | | | | | | | | | |
| British India | 96 | 42,650 | 58 | 44,090 | 29 | 35,136 | | | 15 | 11,277 | 8 | 12,157 | | |
| Ceylon | 2 | 844 | 8 | 6,422 | 2 | 2,533 | | | 4 | 4,725 | 10 | 11,564 | | |
| Straits Settlements | 6 | 3,104 | 2 | 1,764 | 9 | 9,847 | | | | | | | | |
| China | 34 | 15,903 | 33 | 24,301 | 32 | 36,346 | | | 12 | 4,310 | 12 | 19,516 | | |
| Chosen | 1 | 450 | | | | | | | | | | | | |
| Java and Madura | | | 30 | 21,260 | 22 | 25,393 | | | | | 4 | 4,364 | 2 | 2,200 |
| Other Dutch East Indies | | | 20 | 12,924 | 8 | 8,374 | | | | | 4 | 3,810 | | |
| Hejaz and Arabia | | | | | | | | | | | | | | |
| Hongkong | 13 | 4,540 | 1 | 775 | 11 | 11,794 | | | | | | | | |
| Japan | 229 | 76,738 | 31 | 21,401 | 37 | 40,600 | 4 | 8,548 | 102 | 37,074 | | | | |
| Kwangtung | | | | | 4 | 7,010 | | | | | 2 | 2,935 | | |
| Palestine and Syria | 81 | 31,678 | 6 | 4,362 | 18 | 21,787 | | | | | | | | |
| Persia | 16 | 5,814 | | | 1 | 805 | | | | | | | | |
| Philippine Islands | 146 | 61,575 | 32 | 22,788 | 61 | 62,589 | 8 | 24,070 | 54 | 25,800 | 12 | 12,860 | | |
| Siam | 2 | 1,020 | | | | | | | | | | | | |
| Turkey | | | | | | | | | | | | | | |
| Oceania | | | | | | | | | | | | | | |
| Australia | 1,105 | 466,527 | 1,091 | 712,315 | 495 | 591,585 | 20 | 44,051 | 118 | 87,408 | 80 | 105,847 | 64 | 129,012 |
| British Oceania | | | 4 | 2,909 | 1 | 1,093 | | | | | | | | |
| French Oceania | 2 | 790 | 2 | 1,225 | 1 | 1,835 | | | | | | | | |
| New Zealand | 43 | 21,098 | 121 | 86,557 | 112 | 123,338 | 20 | 50,067 | 12 | 12,314 | 14 | 23,220 | 5 | 17,833 |
| Other Oceania | 1 | | 1 | 526 | | | | | | | | | | |
| Africa | | | | | | | | | | | | | | |
| Belgian Congo | 7 | 3,326 | | | | | | | | | | | | |
| British West Africa | 3 | 1,404 | 1 | 801 | | | | | 2 | 1,306 | 22 | 24,895 | | |
| British South Africa | 71 | 37,782 | 215 | 164,611 | 190 | 204,787 | 2 | 5,485 | 6 | 4,356 | | | 1 | 2,327 |
| British East Africa | 17 | 8,471 | 5 | 3,764 | 13 | 14,493 | | | | | | | | |
| Canary Islands | 9 | 3,792 | | | 5 | 5,589 | | | | | | | | |
| Egypt | 16 | 7,901 | 2 | 1,625 | 3 | 3,483 | | | | | | | | |
| Algeria and Tunis | 6 | 1,924 | | | | | | | | | | | | |
| Other French Africa | 13 | 4,452 | | | | | | | 13 | 4,620 | | | | |
| Madagascar | | | | | | | | | | | | | | |
| Morocco | 1 | 373 | | | | | | | | | | | | |
| Portuguese East Africa | 1 | 450 | 7 | 5,630 | 5 | 5,270 | | | | | | | | |
| Other Portuguese Africa | 6 | 2,700 | 15 | 12,007 | | | | | 20 | 6,800 | | | | |
| Spanish Africa | | | | | | | | | 2 | 900 | | | | |
| Total | 4,417 | \$1,648,517 | 2,801 | \$1,953,260 | 2,645 | \$3,072,061 | 279 | \$800,231 | 1,821 | \$625,047 | 454 | \$616,739 | 115 | \$289,374 |

and Tires for June, 1924

| ELECTRIC VEHICLES | | PARTS | TIRES | | | | | | COUNTRIES |
|-------------------|---------|-------------|---------|-------------|---------|-----------|-------|-----------|-------------------------------|
| No. | Value | | Casings | | Solid | | Inner | | |
| | | No. | Value | No. | Value | No. | Value | | |
| | | \$250 | | | | | | | Europe |
| | | 180 | | | | | | | Austria |
| | | 585,020 | 557 | \$15,490 | 262 | \$866 | | | Azores and Madeira Islands |
| | | 189 | 525 | 15,245 | 260 | 886 | | | Belgium |
| | | 583 | 65 | 970 | | | 28 | \$1,001 | Bulgaria |
| | | 1,581,950 | 7,208 | 60,477 | 6,822 | 8,338 | 33 | 1,124 | Czechoslovakia |
| | | | | | | | | | Denmark |
| | | 1,591 | 1,137 | 17,484 | 1,262 | 2,471 | | | Estonia |
| | | 83,848 | 572 | 12,323 | 357 | 1,539 | | | Finland |
| | | 12,260 | 134 | 3,676 | 134 | 508 | 50 | 1,960 | France |
| | | 9,449 | 445 | 6,982 | 490 | 955 | 141 | 3,575 | Germany |
| | | | | | | | | | Greece |
| | | 164 | 20 | 181 | | | | | Hungary |
| | | 114,328 | 594 | 5,090 | | | 12 | 292 | Iceland and Faroe Islands |
| | | 245 | | | | | | | Italy |
| | | | | | | | | | Latvia |
| | | 916 | 69 | 611 | 114 | 198 | | | Lithuania |
| | | 179,879 | 2,007 | 27,449 | 1,093 | 1,566 | 62 | 1,563 | Malta, Gozo and Cyprus |
| | | 7,273 | 2,269 | 25,741 | 2,501 | 5,340 | 39 | 1,348 | Netherlands |
| | | 878 | | | | | | | Norway |
| | | 5,601 | 180 | 1,343 | 144 | 188 | | | Poland and Danzig |
| | | 1,096 | | | | | | | Portugal |
| | | 220 | | | | | | | Rumania |
| | | 199,976 | 330 | 8,487 | 247 | 1,120 | 52 | 1,687 | Russia |
| | | 127,535 | 3,129 | 51,025 | 3,048 | 6,039 | 34 | 1,614 | Spain |
| | | 4,469 | 810 | 17,918 | 602 | 1,738 | | | Sweden |
| | | 1,923 | | | | | | | Switzerland |
| | | 148,550 | 10,711 | 154,817 | 8,400 | 14,301 | 3,420 | 65,017 | Turkey |
| | | 951 | | | | | 72 | 1,805 | England |
| | | 9,509 | 108 | 938 | | | 50 | 1,313 | Scotland |
| | | 426 | 27 | 418 | 54 | 118 | | | Ireland |
| 1 | \$1,705 | 1,437,137 | 3,282 | 33,068 | 1,890 | 3,830 | 105 | 2,969 | Yugoslavia, Albania and Fiume |
| | | 273 | 4 | 43 | 3 | 8 | | | North and South America |
| | | 1,303 | 157 | 3,299 | 161 | 452 | | | Canada |
| | | 3,010 | 156 | 2,782 | 223 | 493 | 1 | 21 | British Honduras |
| | | 2,489 | 112 | 1,615 | 160 | 298 | 26 | 1,093 | Costa Rica |
| | | 1,384 | 87 | 909 | 207 | 324 | | | Guatemala |
| | | 8,655 | 1,114 | 16,790 | 1,000 | 2,309 | 23 | 715 | Honduras |
| | | 2,278 | 176 | 3,707 | 310 | 854 | | | Nicaragua |
| 6 | 3,014 | 125,805 | 15,945 | 131,711 | 10,245 | 18,610 | 133 | 4,732 | Panama |
| 1 | 1,500 | 2,237 | 166 | 2,543 | 163 | 279 | 2 | 54 | Salvador |
| | | 3,036 | | | 66 | 83 | | | Mexico |
| | | 11,510 | 183 | 2,304 | 67 | 132 | 55 | 1,164 | Newfoundland and Labrador |
| | | 7,465 | 179 | 2,236 | 50 | 100 | 10 | 176 | Barbados |
| | | 1,818 | 141 | 1,542 | 121 | 193 | 35 | 1,139 | Jamaica |
| | | 75,740 | 6,244 | 79,053 | 13,734 | 25,955 | 132 | 6,012 | Trinidad and Tobago |
| | | 9,544 | 1,030 | 9,619 | 1,746 | 2,569 | 94 | 2,133 | Other British West Indies |
| | | 2,308 | 120 | 1,376 | 169 | 285 | | | Cuba |
| | | 819 | 2 | 156 | 2 | 18 | | | Dominican Republic |
| | | 3,811 | 324 | 4,587 | 450 | 837 | | | Dutch West Indies |
| | | 2,337 | 12 | 135 | | | 2 | 56 | French West Indies |
| | | 199,985 | 5,354 | 101,092 | 7,388 | 16,675 | 84 | 3,659 | Haiti |
| | | 1,378 | 66 | 1,312 | 72 | 163 | | | Virgin Islands |
| | | 529,094 | 3,085 | 34,268 | 1,142 | 4,400 | 106 | 2,316 | Argentina |
| | | 19,965 | 206 | 4,661 | 1,096 | 1,799 | 4 | 85 | Bolivia |
| | | 19,037 | 612 | 8,317 | 837 | 1,803 | 54 | 2,144 | Brazil |
| | | 5,050 | 49 | 937 | 298 | 588 | 4 | 80 | Chile |
| | | 1,228 | 8 | 260 | 6 | 33 | 10 | 168 | Colombia |
| | | 416 | 17 | 162 | 24 | 28 | | | Ecuador |
| | | 235 | | | | | | | British Guiana |
| | | 50,319 | 2,742 | 41,893 | 2,643 | 5,477 | 47 | 1,644 | Dutch Guiana |
| | | 15,891 | 1,516 | 20,288 | 1,136 | 1,985 | 20 | 364 | Paraguay |
| | | 14,187 | 1,212 | 15,225 | 1,763 | 3,763 | 4 | 409 | Peru |
| | | | | | | | | | Uruguay |
| | | | | | | | | | Venezuela |
| | | 290 | 40 | 324 | | | | | Asia |
| | | 41,172 | 1,175 | 16,174 | 1,179 | 2,330 | 115 | 3,516 | Aden |
| | | 2,461 | 196 | 1,994 | 12 | 23 | 49 | 1,107 | British India |
| | | 13,625 | 745 | 9,694 | 250 | 793 | 15 | 372 | Ceylon |
| | | 12,367 | 604 | 7,391 | 53 | 130 | 4 | 51 | Straits Settlements |
| | | 4,715 | 85 | 614 | 50 | 63 | | | China |
| | | 14,580 | 1,984 | 25,652 | 1,275 | 3,102 | 248 | 6,022 | Chosen |
| | | 5,738 | 328 | 3,376 | | | 129 | 3,006 | Java and Madura |
| | | 947 | 13 | 91 | 75 | 91 | | | Other Dutch East Indies |
| | | 3,334 | 134 | 1,084 | | | | | Hejaz and Arabia |
| | | 49,214 | 9,462 | 90,999 | 7,640 | 11,085 | 319 | 5,288 | Hongkong |
| | | 2,257 | 52 | 550 | 50 | 77 | | | Japan |
| | | 4,469 | 284 | 2,795 | 260 | 397 | | | Kwangtung |
| | | | | | | | | | Palestine and Syria |
| | | 32,466 | 3,233 | 43,844 | 5,088 | 9,330 | 329 | 8,740 | Peria |
| | | 992 | 20 | 173 | | | | | Philippine Islands |
| | | 265 | | | | | | | Siam |
| | | | | | | | | | Turkey |
| | | 247,322 | 5,785 | 103,374 | 9,969 | 21,262 | 719 | 22,191 | Oceania |
| | | 1,341 | 24 | 316 | | | | | Australia |
| | | 644 | 25 | 459 | 33 | 48 | 10 | 269 | British Oceania |
| | | 93,413 | 3,852 | 50,798 | 2,968 | 5,571 | 759 | 26,696 | French Oceania |
| | | 422 | 21 | 275 | 27 | 63 | | | New Zealand |
| | | | | | | | | | Other Oceania |
| | | 396 | | | | | | | Africa |
| | | 6,200 | 156 | 1,544 | 129 | 469 | | | Belgian Congo |
| | | 88,070 | 2,091 | 31,370 | 4,031 | 7,826 | 20 | 584 | British West Africa |
| | | 4,731 | 516 | 6,887 | 104 | 224 | | | British South Africa |
| | | 4,181 | 20 | 443 | 14 | 49 | 32 | 833 | British East Africa |
| | | 3,612 | 71 | 1,059 | 63 | 90 | 2 | 26 | Canary Islands |
| | | 2,350 | | | | | | | Egypt |
| | | 3,153 | | | | | | | Algeria and Tunis |
| | | 310 | | | | | | | Other French Africa |
| | | 124 | | | | | | | Madagascar |
| | | 8,254 | | | | | | | Morocco |
| | | 558 | 33 | 385 | 28 | 56 | | | Portuguese East Africa |
| | | 689 | | | | | | | Other Portuguese Africa |
| 8 | \$6,219 | \$6,293,675 | 106,637 | \$1,339,200 | 106,051 | \$202,893 | 7,694 | \$192,212 | Spanish Africa |
| | | | | | | | | | Total |

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

THE first six months of 1924 show numerous changes in leading foreign markets for American automotive vehicles, compared with yearly figures for 1923.

The most noteworthy fact brought out is that Australia and Japan remained respectively the best markets for passenger cars and trucks. For both countries the export sales of American vehicles during the first six months of this year shows a very large increase. Australia has bought 20,694 passenger cars in the first half of this year, as compared with 25,817 in the entire twelve months of last year. Japan has taken 3007 trucks so far this year as against 5111 in 1923.

Noticeable changes occurred in the position of other leading markets. In passenger cars, Argentina has risen from sixth to second place taking almost as many in six months this year (5827) as during all of 1923 (6645). Canada has dropped from second to third place; British South Africa has risen from tenth to fourth; Cuba, Japan, and Brazil have improved their positions in the export table and Mexico, United Kingdom and Spain have fallen somewhat.

In trucks, Sweden has risen from fourth to second and Australia has remained at third. Canada remained in fifth place; Cuba, Mexico, Uruguay, Chile, and the Philippine Islands have risen while Spain has receded.

Exports for the first six months of 1924 are far in advance of the rate set during 1923. So far this year, 80,293 passenger cars, valued at \$57,466,400, have been exported from the United States, compared with 127,035 valued at \$90,692,272 in all of 1923. Shipments of trucks this year number 14,572, with a value of \$9,837,258 compared with 24,859, valued at \$15,317,136 during the twelve months of 1923.

"Free Air" in Other Countries

TIRE inflation equipment in foreign markets, together with many other types of automotive servicing, is far below the standard set in the United States, according to a series of cables just received from various consuls and commercial attachés. Cheap labor and absence of demand for better facilities explain in large part the lack of modern equipment in most foreign countries. As the number of automotive vehicles increases, however, the market for such apparatus is steadily expanding.

There is no mechanical tire inflation equipment used in Gibraltar either in public garages or by private owners. The garage proprietors feel that in view of the small number of cars handled the expense of installing mechanical equipment would not be justified.

Although some dealers have installed tire inflation equipment in Tokyo, Japan, it is little used, since the garage boys are accustomed to using hand

pumps and employ them rather than move cars to the air hose.

In Cuba it is believed that tire inflation equipment could be handled with reasonable success if the agencies were given to some large domestic firm working the whole island with equipment which would sell at a very reasonable figure. This firm should also carry a sufficient stock of spare parts to warrant quick replacements.

In Nice, France, none of the garages have tire inflation equipment, and only two tire repair shops have installed air compressors. Compressed air, on the other hand, is sold in bottles.

There are very few cars in use in the Palermo district of Italy, and the service station as recognized in the United States is unknown. To date there has been little or no demand for tire inflation equipment.

In Stavanger, Norway, the increased use of motor cars, and especially taxicabs, is more than sufficient to warrant installation of mechanical tire inflation equipment, and although the marked industrial depression now existing has a naturally unhealthy effect on immediate buying, there undoubtedly exists an opportunity for the sale of several units.

There has been no effort made to cover the Bombay district of India, which, while not large, includes fifteen or twenty dealers who are in a position to purchase tire inflation equipment at the present time.

Practically all garages of any consequence in or anywhere near Melbourne, Australia, are already equipped with mechanical tire inflation equipment. Replacements and the possibility of new garages and service stations opening up, may create a limited further demand in the future.

Foreign Dealer Lists Available

MORE than a hundred automobile importers and dealers of foreign countries have written recently to the Commercial Intelligence Division of the U. S. Bureau of Foreign and Domestic Commerce asking for data on American automobile manufacturers desiring to make connections in their countries.

Lists containing the names and addresses of importers and dealers of automotive products in thirty-eight foreign countries with pertinent commercial data may be had without charge, from the automotive division of the U. S. Department of Commerce.

Austrian Duties Prohibitive

AN almost prohibitive embargo on importation of automobiles into Austria is being considered by the Austrian Parliament. The proposed new tariff would increase customs duties from about \$200 to \$1,400 on automobiles and about \$100 on motorcycles.

~ Editorial ~

Easy Steering

EVERYONE admits that balloon tires make steering somewhat harder and much has been done to counterbalance this increased resistance to turning the front wheels by making less resistance at knuckle pin bearings and other joints in the steering system. Greater reductions in steering gears are being used also, though they "slow up" the steering, that is, they require more turns of the steering wheel to swing the road wheels through a given angle.

Inclined knuckle pivots, considered a necessity by some engineers when front wheel brakes are employed, are said to make for harder steering and probably do increase steering resistance to a certain extent. Approximate center point steering can be secured in another way, however, by bringing the knuckle pivot axis close to the center plane of the wheel and not inclining it transversely. Shimmying tendencies are believed to be less with such a design.

It is more difficult to bring the knuckle pivot very close to the center plane of the wheel with wood and wire wheels unless considerable deviation from more or less "standard" knuckle design is resorted to, than it is with certain designs of disk wheels, one type of which is used in the latest Nash models. With this arrangement steering is said to be quite sensitive. No doubt it will be given consideration by others who are facing similar problems.

Engine Wear

ALTHOUGH the fact is not established fully, there are many indications that the most rapid wear takes place in engine cylinders during the starting and warming up period when lubrication conditions are apt to be far from ideal. An article which appeared recently in these columns showed conclusively that engines which depend for piston lubrication upon oil which escapes from the crankshaft bearings often receive no oil at all on the cylinder walls for several minutes after the engine starts, especially if bearing clearances are small.

When the engine jackets are cold conditions are still worse, for then water condensed from the products of combustion, mixes with such oil as may be present and is believed to detract materially from its lubricating value.

Much higher oil pressures may obviate part of the difficulty. In general the oil pressure relief valve is set to release at or about 30 or 40 lb. gage pressure. It might be set for a much higher pressure, say 400 lb. if the pump capacity were decreased materially and still not over lubricate at high speed. Such a

plan is followed with some foreign engines and is said to work out to good advantage. It is deserving of a trial on American passenger car engines.

Flooding with gasoline during the starting period is another factor which is apt to increase wear at this time. A substitute for the choke, such, for example, as the electric fuel heater used by one or two car makers, is worth consideration.

Fair Dealing

BALANCED inventories are desirable but may work a great hardship on those who furnish materials and parts for automobile or truck manufacture if they are balanced by the simple expedient of shipping back to the makers those materials or parts which are not immediately required. Such procedure is likely to place the maker in just the position the car manufacturer is trying to avoid, that is, with material on hand which is not immediately marketable. The parts and material maker may hesitate to complain for fear of losing future business. If the purchaser would inform the concern from whom he purchased the material in question of his overstock and ask if it could be returned without embarrassment or shipped elsewhere to some other customer it would be of considerable help.

Unless some action of this sort is taken, the maker is bound to suffer a loss which is likely to be passed on in time in the form of higher prices. In any case it is evident that, in the last analysis the purchaser must stand for losses of this character, for no manufacturer can take them indefinitely in any large amount and continue in business.

Rain Protection

WHEN a lot of water is shed from the roof of a car onto the windshield it is rather difficult to prevent some of it from entering the driver's compartment, especially if conditions are such as to require that the windshield be kept open part way for ventilation or clear vision.

A drip molding of good size with proper vent holes will help to prevent this, providing the holes are large enough, are properly placed and are kept clear.

One of the functions which should be performed by a visor is to help prevent water from reaching the upper windshield glass, but if the visor has no gutter at its lower edge it may make conditions worse rather than better. Turning the lower edge of the visor back to form a gutter has some rather obvious advantages.

Our Industry Today—

August Production Will Not Exceed the July Total by a Wide Margin According to the Present Rate of Operations in Plants

NEW YORK, Aug. 11—Automobile producers are maintaining a slight increase in production as the month advances, with some of them on relatively high schedules. The general run of output throughout the industry at present, however, does not promise that the production mark of July will be overreached by a wide margin. July production mounted somewhat over June, reversing the condition of a year ago, when a perceptible drop from the June figure was noted in July of that year.

A better tone has been given to retail sales, but producers, as a whole, are manufacturing only as the demand comes and with no object of stocking dealers against any possible development in sales volume. The farm situation may develop at an early date into an important factor in automobile sales, but until there is actual proof that the farmer is entering the market for cars in sufficient number to justify it, automobile manufacturers will not speed up production beyond a reasonably conservative point.

Dealers in agricultural sections feel that farmer buying will appear to some extent this month and become more appreciable with the beginning of autumn. Evidence has already been given, though in a comparatively slight measure, of a more cheerful disposition on the part of the farmer to make purchases of motor vehicles.

With the majority of the new models placed on the market this month, it is believed that such sales resistance as the

new model season offers will be overcome and prospects who have delayed buying will begin to take cars. This should bring about a greater improvement in sales in September, with the consequent stepping up of production schedules.

The relatively low production marks of the last two months and the volume of sales reported have enabled dealers to rid their floors of much of their surplus stock and stand in readiness for the new output. The same conditions have permitted manufacturers to move their warehoused accumulations, so that the situation that faced the industry in the spring has been relieved in a marked degree.

Parts makers are operating on the same conservative schedules that govern car production and will reach no higher level than now exists until the allied branches of the industry increase their programs. Replacement parts makers report a good and steady demand for their products.

Cleveland Stocks Cut to Low Limit

Cars Moving Fast and Improved Fall Business is Anticipated by Factories

CLEVELAND, Aug. 11—Just how close the distributors have been buying cars to their actual sales needs, is indicated by the statement of the Cleveland Association of Automobile Manufacturers and Distributors, to the effect that at the present time dealers in the district have not to exceed 30 days' supply of new cars on hand.

Manufacturers point out that this estimate is probably too liberal, in view of the betterment which has appeared in sales during the past week. They feel the supply of cars on hand here is but typical of a general condition over the country, and are thus anticipating a strong late summer and fall business.

Finances Satisfactory

In spite of fluctuating conditions in the industry and business generally, and the realization that some changes may be necessary in methods of distribution, the plants in this territory are showing themselves to be in a strong financial condition for the portion of the current year just completed.

An example of this is to be found in the case of Chandler which has just announced that earnings are such as to warrant distribution of a portion of them

to employees of the firm. Other companies, all of which made good showings on earnings for the first half, assert they will be able to show even better balance sheets for the last half of 1924.

A review of plant executives indicates a general feeling that all that is now needed to make 1924 a banner year in the automotive field is concerted action on the part of builders, distributors and the press to drive the psychological blues from the atmosphere. It is held that the country is now simply waiting for someone to "take the bull by the horns" and throw him out, so the timid folks can again regain their business poise.

Lansing and Milwaukee Report More Employment

WASHINGTON, Aug. 14.—Some improvement in the employment situation in automotive centers is noted in reports received by the United States Employment Service and published in the August number of the Industrial Employment Information Bulletin. Lansing advises that "employment in the automobile industry is a little more encouraging" and Milwaukee reports that a slight improvement was noticeable in July in motor accessory plants.

Flint, to the contrary, declares that "plants are operating only part time, affecting 15,000 to 16,000 men, and there is a surplus of automobile workers." Considerable employment exists in Cleveland at the present time, particularly in the automotive industry and a large surplus of labor is reported in Toledo.

Detroit Preparing for Fall Season

By Sept. 1 All New Models Will Be Out and Plants Set for Increased Production

DETROIT, Aug. 11—New model announcements will be made by two more large producing companies within the next 10 days, further clarifying the manufacturing situation in this district, and making the number of factories which are down preparatory to model changes comparatively few. By Sept. 1, or soon after that date, practically all new models coming out for the fall season will be on the market, with the prospect that none additional will be presented before the national shows.

Pushing New Models

Manufacturing operations on the new models, now going forward in most factories, signalize the clearing away not only of all stocks of parts and materials used in the former models, but also indicate that stocks of the former models in dealers' hands are close to the vanishing point. The industry is practically ready in every particular for the opening of the fall season and it is starting off with a generally clean slate.

Good buying in the farming districts in the fall season will not involve a used car problem, according to the estimates of officials, because a large part of the vehicles now being used have passed

Most New Models Now on Market

their stage of usefulness and will be scrapped. Owners in the farm districts have been making cars do that ordinarily would have been replaced earlier, officials declare, so that a question of trading will not be involved if farmer finances permit new car buying.

Continued progress is being made in bringing production activities higher. There will be no real reflection of this until later in the month and after the first of September, though some factories are operating at a high rate now and will step this up as the fall season gets under way.

Factories bringing out new models will not have an opportunity to get into production definitely until later in the month, but in the meanwhile operations in the parts and body plants are much improved.

Manufacturers who brought out new models July 1 report a very satisfactory movement of cars during July, a month which in a majority of cities in the country set a new high sales mark for these particular companies. The business that these companies have stimulated during July and August will be shared in September by the other manufacturers whose new cars will get going then.

Good Crop Prices Aid Farm Equipment Trade

RACINE, WIS., Aug. 11—For the first time in nearly four years, the agricultural machinery industry is able to look forward to improving business, which is a condition that already has set in. The degree of the betterment is indicated by the fact that all of the large implement and tractor concerns in Racine have resumed production on a quantity basis.

The J. I. Case Threshing Machine Co. has practically reached normal with respect to the number of men employed. Warehouse stocks are steadily being worked down to a minimum, making immediate replenishment necessary as well as desirable in view of the much better sale of these machines. The automobile department likewise is experiencing better trade.

The J. I. Case Plow Works Co., which also makes the Wallis tractor, has resumed production after a month's recess for inventory, repairs and to await a better accumulation of orders.

The outlook for fall and winter, as well as for the entire coming year is said to be the best since 1919 and 1920. If crop conditions and prices are maintained, manufacturers and distributors expect to be able to clear a large volume of merchandise, with producers able to liquidate their indebtedness and able to come into the equipment market once more.

Manufacturers are striving to lower costs and reduce selling prices.

Automobile Steels Take Another Drop

Parts Makers in Market, Pittsburgh Reports, At New Price of 4.75

PITTSBURGH, Aug. 11—Following a cut in the price of automobile sheets as revealed last week, there have been fur-

ther recessions, and the price of this grade of steel has settled at 4.75. The American Rolling Mill Co. of Middletown, Ohio, was the first to name this price last week, and with such action it was only a matter of a short time before the other independent companies followed.

The leading interest in the sheet industry pursued the policy it has adopted of late in meeting all independent competition, and the latter part of last week went to the 4.75 price for its automotive sheet. Buyers are in the market, particularly parts makers, and a good amount of sheet business has been reported as taken here by both the leading interest and the independent companies, although the margin of improvement in the automobile sheet line is not nearly as extensive as has been the case in the commoner grades.

The only factor in the situation, from the viewpoint of the steel men, that needs revision and needs it quickly is the matter of price, for there is as yet no tendency toward greater firmness. However, some companies are maintaining a very close selling policy, being careful not to take orders for too far ahead, that they may be able to reap the benefits of any change in the price situation.

One business that is looking up here rapidly, one that has been in the deepest despondency of any American industry this year is coal. Reports are being received of mines opening up daily and a healthy volume of inquiry is being reported from many sections. As in steel, prices have not yet responded.

The Week in the Industry

July production of cars fell slightly below the 262,500 estimated last week, the revised figures being 258,200 according to the N. A. C. C. This records a 5.3 per cent increase over June.

The General Motors report shows a 7.7 per cent decrease in retail sales for the first seven months of this year as compared to the same period in 1923.

Oakland has announced its new models for 1925 with a price increase of \$100 on each one. Changes and improvements include slightly increased bore, increased gear ratio, balloon tires on all models and the new Fisher VV windshield on all closed jobs.

Oldsmobile also has announced the new models with some little change in the design of the radiator.

Unexpected increase in the demand for tires is forcing factories to increase production despite the stocks were on hand. In Akron alone, 80,000 tires per week are being built at the present time. According to a survey made by the Illinois Merchants Trust Co. larger profits per tire are predicted in 1924 than in 1923 provided there is no important change in prices. Tire manufacturers, on the other hand, claim that placing their plants in condition to take care of a large volume of business now, and hiring and breaking in labor will reduce the profit per tire. They believe that it was a mistake to reduce the production of tires this year a month earlier than usual.

Fifteen per cent more Ford cars were sold in the United States in the first six months of 1924 than in the same period of 1923 which established a record for first half-year sales.

Automotive exports for the fiscal year ended June 30, 1924, reached a total value of \$211,843,129. Compared with other fiscal years this is relatively a high figure.

Plants in Janesville Resuming Activities

JANESVILLE, WIS., Aug. 11—Activities were resumed during the past week at both the Chevrolet and Fisher Body works here after a period of minimum production which was lengthened to some extent from the usual summer recess by conditions in the industry. The regular Chevrolet production schedule will be reinstated Aug. 15. The force has been gradually stepped up from 75 to 200 since Aug. 1 to prepare materials for progressive departments. The Fisher body plant started work somewhat earlier to make ready a supply when the chassis come through in quantity.

PORTUGAL LIMITS IMPORTS

WASHINGTON, Aug. 13—The Portuguese Government has prohibited, from Aug. 6, 1924, the importation into Portugal and the adjacent islands of passenger cars weighing up to 3000 kilos, inclusive, the Department of Commerce has been advised. Cars now in transit to Portugal are exempt from this ruling.

Dealers Ask Makers to Help in Problems

Letter from Chicago Requests Them to Make Merchandising Recommendations

NEW YORK, Aug. 11—Appointment of committees representing the National Automobile Chamber of Commerce and the National Automobile Dealers Association "to investigate automobile merchandising conditions and make recommendations for such changes as would improve dealer conditions" is asked by the Chicago Automobile Trade Association.

Accompanying this request is a letter from the Chicago association, outlining its views of the present situation and making suggestions as to how it believes conditions might be improved.

N. A. D. A. Making Survey

No formal action on the letter has been taken by either of the bodies appealed to by the Chicagoans. The Chamber has sent copies of the letter to its members for their information, while General Manager C. A. Vane of the N. A. D. A. has circularized his membership, asking each member if the Chicago conditions are apparent elsewhere and if any other local dealer association has taken similar action. Also he asks if there is any necessity for such action as proposed by Chicago. When this survey is completed it is expected Mr. Vane will decide on what the next step will be.

The Chicago letter is signed by Vice-President Dayton Keith and was sent out following a meeting last month which, he says, was attended by representatives of practically all of the distributing organizations in that territory. He declares that it was unanimous that the Chicago viewpoint be presented to the manufacturers.

Citing Chicago's views, Mr. Keith declares his fellow members desire to avoid yearly models. They believe manufacturers should "study the country's power of absorption to the point where production is retarded before a dealer has to accumulate more than a 45 days' supply of cars at any one time." They think manufacturers should study the retailers' financial statements and where operating costs demand it, discounts should be raised.

Used Car Problem Brought Up

Dealers should be aided in solving the used car problem through the factories studying the retailers' capacity "to make commercially sound exchanges for used cars," Chicago says.

New models should not be advertised until they are ready for dealer distribution or at least not until the dealers' warehouses are cleared of old models, it is held, while there should be a definite time for announcing such new models—preferably around July 1. Avoidance of

NEW SHOW FEATURE INDORSED BY TRADE

NEW YORK, Aug. 11—Neal G. Adair, manager of the show department of the Motor and Accessory Manufacturers Association, has written to more than 400 jobbers and car dealers asking them if they favor the two-days-for-the-trade feature of the next national shows and if they will avail themselves of the opportunity offered to transact business at the shows.

Replies have been almost unanimous in indorsing the action of the show management in setting aside the trade days. Jobbers say they intend sending their prominent executives, while car dealers carrying accessories as a side line state they will attend the shows, prepared to place orders for goods on display that attract their attention.

Drumming up the attendance this far in advance is expected to stimulate interest among those who will take advantage of the trade days to inspect the exhibits of the parts and accessory makers carefully and buy accordingly.

the term "New 1929 Model Just Out," is suggested.

Dealers, too, would be helped, Chicago thinks, if price changes came at some definite period, rather than being spread out over several months.

"Bay State" Creditors Approve Financing Plan

BOSTON, Aug. 13—The Bay State car is to be continued in production under a plan worked out by the creditors of all the R. H. Long companies and voted upon by the various interests. It has been decided to form a corporation to take control of the companies and operate them under the plan of a three years' extension of credit, paying off one-third of the indebtedness each year. The creditors will have control, but working with them will be R. H. Long and some of the others identified with the company.

Guy D. Murchie, receiver, will make his report, after which the plan must be approved by the court. It is believed that favorable action will be taken.

Meanwhile the Luxor Cab Co. has taken over part of one of the Long factories for building taxicabs, and plans to make a car later—the "Standish."

DETROIT BUYS FAGEOL BUS

DETROIT, Aug. 13—The city of Detroit is taking delivery this week of a double-decked Fageol bus which will be placed in experimental operation by the Street Railway Commission. The city is planning to supplement its street railways with buses. The possible purchase of 100 buses in the next 90 days is indicated.

Ford Sales Reached 1,113,538 in 6 Months

Includes Cars and Trucks Sold Everywhere—U. S. Absorbed 1,026,978 Vehicles

DETROIT, Aug. 14—Final figures by Ford Motor Co. on sales of cars and trucks in the first six months of the year fix the total at 1,113,538. Sales in foreign countries aggregated 86,560, which, deducted from the total figure, gives 1,026,978 as sales in the United States. The figure in the United States is approximately 15 per cent larger than the best previous record of 893,883, which was made in the first half of last year.

Sales of Lincoln cars, which are not included in the above totals, nor are tractors, were 4015 in the United States, an increase of 42 per cent over the best previous six-month period. Lincoln sales in foreign countries were 36.5 per cent over the record for the six months last year.

Tractor sales continued at practically the same rate as in 1923, with a total of 43,234 deliveries. The June, 1924, tractor sales rate was 30 per cent greater than June last year, however; the company reports, indicating increasing farm prosperity. Foreign tractor sales totaled 6419, an increase of 43.7 per cent over the former high record.

Erecting Plant at Norfolk

DETROIT, Aug. 13—Work on a Ford assembly plant at Norfolk, Va., has been started, and the plant will be ready for operation about the first of the year. The plant will be the thirty-fifth assembly unit in the United States and will add approximately 90,000 cars yearly to the production capacity.

Shipping from the plant will be both by boat and rail in its territory, a government permit having been issued for construction of a large pier at which ocean steamers may dock. As export shipping increases, the company indicates that the increase or part of it will be handled through the Norfolk plant.

The main factory building will conform to the standard plans adopted by the Ford company. A separate powerhouse building equipped with a Ford built steam turbine and a large oil warehouse are included in the plant layout.

An outstanding feature of the plant will be a conveyor delivery system, connecting with the storage lines, whereby cars by types will be delivered for drive-away simply by pressing an electric button.

EDWIN S. MOLDENHAUER DIES

MILWAUKEE, Aug. 9—Edwin S. Moldenhauer, vice-president and general manager of the Milwaukee Die Casting Co., died last week after a brief illness from heart trouble. He was 50 years of age and a native of Wisconsin.

Sees Larger Profits Each Tire This Year

Chicago Bank Optimistic Over
Situation — Surplus Stocks
Estimated at 18,000,000

CHICAGO, Aug. 13—Banking interests have been investigating the condition of the tire industry, and as a result of a survey recently completed, the Illinois Merchants Trust Co. is inclined to be optimistic as to the present situation. It predicts larger profits per tire during most of 1924 than in 1923, providing there are no important changes in prices.

This survey was made by Rudolf A. Clemon, who estimates that at the present time about 11,000,000 tires are being carried by dealers and 7,000,000 by manufacturers—a total surplus supply of 18,000,000. This, on a basis of 45,000,000 tires consumed in 1923, represents about a five months' supply, he says.

Reduced Stocks Expected

"It is expected that an increase in the replacement business will take place in the next three months, which will reduce dealers' stocks materially," Mr. Clemon continues. "A further and greater reduction in production at the factories will be necessary if producers' stocks are to be brought down to a normal basis. Yet some factories are continuing at a pace of 25,000 tires a day. On the whole, however, manufacturers want to begin the autumn business with small stocks. Mr. Clemon then adds:

The tire industry as a whole is rather well prepared for a period of temporarily declining business. Many are carrying rather light supplies of crude rubber and cotton fabrics. Financially, too, tire companies are in a fairly good position. Bank loans are at a record low, and the larger companies have conserved their resources. As a result their cash position compares favorably with that of 1919. At the end of 1923 five of the leading companies had cash on hand of \$9,000,000 and inventories of \$73,000,000, compared with cash of \$36,000,000 and inventories of \$121,000,000 in 1919. In 1923 cash was 40 per cent of inventory, and in 1919 only 30 per cent.

Today labor costs are better, wages at the factory are lower, and labor more efficient. Daily production at the present time averages nearly three tires per worker, whereas shortly after the war it was only one tire.

Price Situation Uncertain

AKRON, Aug. 12—But for the fact that one of the most important automobile tire manufacturers has earned his dividend requirements for the present year, and is satisfied with this showing, the price of tires would be advanced early in September, in conformity with the increased cost of raw materials.

The only alternative to the raising of prices, in the opinion of many manufacturers, is to have the second half of the present year repeat the history of the latter part of 1923 when the in-

Better Crop Yields and Increasing Prices for Farm Products Brighten Business Outlook

AN INTERVIEW WITH R. T. HODGKINS,
Vice-President and General Sales Manager of the Rollin Motors Co.

By John B. Abeil,
Special Cleveland News Representative of the Class Journal Company

Cleveland, Aug. 12.

THAT the immediate outlook for business in general is particularly favorable, with strong possibilities of continued prosperity for a considerable period, is the viewpoint of R. T. Hodgkins, vice-president and general sales manager of the Rollin Motors Co.

Agriculture and manufacturing are industries of gigantic proportions in this country today and are so co-related and interdependent that any influential factors affecting the one are sure to be reflected in the other, Mr. Hodgkins says. It is now very apparent, he declares, that crop yields and higher prices maintaining in agricultural pursuits will be productive of a material revival in the farm market and, in fact, it is forecast that the results will show an increase this year in farm wealth totaling more than a billion dollars.

To enumerate some specific instances, Mr. Hodgkins cites the case of Montana, where buying in any volume has been practically nil for the last four years. That State is now riding on top of the wave of prosperity and the whole Northwest, with little exception, is similarly affected.

Attention is likewise being focussed with a good deal of satisfaction on the corn and winter wheat belt of the Middle West which has exemplified during the last four years the so-called depression condition from an agricultural viewpoint.

California, the proverbially known fruit basket of the country, has weathered the impending hoof and mouth disease epidemic and come out of it with up to the average yields and increased prices for their products maintaining, Mr. Hodgkins says. Cotton and other crops of the South and Southwest are favorable. The wheat situation is good.

This condition not only stimulates the movement of manufactured goods to the farmer but also has a very salutary effect on the country as a whole, since much has been said and written during the last few years on the precarious predicament of the farmer. In other words, this changed situation agriculturally will serve as a confidence restorer throughout business as a whole.

The benefit of the prosperity accruing to manufacturers in the automobile industry will be commensurate with the extent to which they sense and meet the present day demand of the motoring public, Mr. Hodgkins declares.

dustry operated at a high rate without showing any profit.

Heretofore outside experts have been unable to see how the rubber companies could make a profit under existing conditions, and at times these companies have done the unexpected and made good showings. How this can be done under present conditions by those companies, which were not well covered by rubber and fabric contracts, and many were not, is not understood.

During the first half of the present year the average net profit on the average tire made by the larger companies amounted to approximately \$1. Since the middle of last month the average cost of rubber used in the average tire has increased between 50 and 60 cents alone, while there has been a material advance in the price of fabric. This increase in raw-material prices coupled with the drop in tire prices registered during the early part of July apparently wipes out all the profits in the business.

These increased material costs are being met by a continuation of the policies effective during the past year to curtail production costs, but these have practically reached the bottom and little can be expected in savings along this line.

Government Files Tax Claim Against Bates

JOLIET, ILL., Aug. 13—Claims for \$26,000 corporation and income taxes was filed by the Federal Government against the Bates Machinery & Tractor Co. at a hearing in bankruptcy before O. R. Laraway, referee.

The income tax was claimed on business in 1918 and 1919, but objected to by counsel for the trustee, Edwin D. Buell, on the ground that a tax claim for \$1,195 had been allowed and the time had expired for further filing.

Schedules showed assets of \$586,832, and liabilities of \$1,443,934. The trustee has been operating the plant for repair parts pending reorganization plans.

REO EXPORTS NEARLY DOUBLED

DETROIT, Aug. 12—The overseas business of the Reo Motor Car Co. for the first seven months of this year totaled 1645 vehicles, almost double the total of 882 for all of last year. The company reports Australia and South Africa as the heaviest buyer and largely increased business in South and Central America.

G. M. C. Retail Sales Show 435,366 Total

Decline in Seven Months from
Corresponding Period a Year
Ago Is 7.7 Per Cent

NEW YORK, Aug. 14—Retail sales by dealers handling General Motors cars are down 7.7 per cent for the first seven months of this year in comparison with the same period in 1923, according to the monthly report issued from headquarters here, the totals being 435,366 as against 472,194.

The report shows that General Motors is following its established policy of not overloading its dealers, for in July deliveries to consumers totaled 55,776, while cars accepted by the dealers totalled 40,797. This is below the June figures of 66,146 to consumers but production evidently was speeded up somewhat, for deliveries to dealers in July exceeded June's 32,984.

The report for the first seven months of 1924 and for corresponding periods in 1923 and 1922 is as follows:

| | 1924 | |
|----------------|------------------|--------------|
| | Sales to Dealers | Retail Sales |
| January | 61,398 | 33,295 |
| February | 78,668 | 50,008 |
| March | 75,484 | 55,845 |
| April | 58,600 | 89,610 |
| May | 45,965 | 84,686 |
| June | 32,984 | 66,146 |
| July | 40,797 | 55,776 |
| Total | 393,896 | 435,366 |
| | 1923 | |
| January | 48,162 | 30,464 |
| February | 55,427 | 41,448 |
| March | 71,669 | 74,137 |
| April | 75,822 | 97,667 |
| May | 75,393 | 89,317 |
| June | 69,708 | 75,952 |
| July | 51,634 | 63,209 |
| Total | 448,815 | 472,194 |
| | 1922 | |
| January | 16,088 | 11,520 |
| February | 20,869 | 14,795 |
| March | 34,082 | 26,615 |
| April | 40,474 | 48,353 |
| May | 46,736 | 51,983 |
| June | 48,541 | 47,058 |
| July | 33,772 | 32,000 |
| Total | 240,562 | 235,324 |

Bank Asks Receivership for Falls Motors Corp.

MILWAUKEE, Aug. 13—The first Wisconsin Trust Co. of Milwaukee has filed suit in the Federal Court seeking the appointment of a receiver for the Falls Motors Corp., Sheboygan Falls, Wis., claiming default in payment of \$15,000 interest due July 1 on a \$500,000 bond issue and failure to pay taxes of \$12,600 which caused Sheboygan County to issue tax lien on the entire property of the company.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, Aug. 12—Improved crop prospects, better business sentiment, especially in the West, some gain in actual trade volumes, and a further reduction in the discount rate of the Federal Reserve Bank of New York to 3 per cent, are the principal features of the current situation. Industrial operations have not yet shown any general upward movement, but, with increased buying by distributors, a more optimistic tone is apparent.

The official report on the cotton crop based on conditions as of Aug. 1 forecasts a total yield of 12,351,000 bales, which compares with a forecast of 11,934,000 bales on July 16 and an actual harvest of 10,128,478 bales last year. The wheat crop is now forecast at 814,000,000 bushels, as against 785,741,000 bushels harvested a year ago, while the probable yield of corn is placed at 2,576,000,000, comparing with the earlier forecast of 2,515,000,000 bushels and last year's harvest of 3,046,000,000 bushels.

The production of pig iron in July amounted to 1,784,899 tons, the lowest total since February, 1922. The average daily output of 57,577 tons compares with 67,541 in June and 118,656 a year ago. The estimated production of steel ingots was 1,869,416 tons, as against 2,056,466 in the preceding month and 3,531,458 in July, 1923, while the daily average of 71,901 tons compares with 82,259 in June and 141,258 in July a year ago.

Car loadings in the week ended July 26 numbered 925,859, comparing with 930,284 in the preceding week and 1,041,415 in the corresponding period last year.

Bank clearings at the principal clearing houses in July reached a total of \$37,507,938,821, as compared with \$35,302,334,731 in June and \$32,185,630,572 in July of last year. With the exception of the approximately equal figure for last January, the July total is the largest since December, 1920.

HOAGLAND HEADS CLYMER

ROCKFORD, ILL., Aug. 12—Frank G. Hoagland, president of the National Lock Co., has been made president of the Clymer Manufacturing Co., recently incorporated with \$600,000 capital. It will manufacture the "through-the-windshield" spotlights, similar to those of the National Lock.

Another Committee on Safety Convenes

Public Relations Holds Initial
Meeting with George M.
Graham Presiding

WASHINGTON, Aug. 14—Practical assurance that Secretary of Commerce Hoover's plans for a National Policy of Street and Highway Safety are rapidly reaching maturity was given here this week at the initial meeting of the Committee on Public Relations when Colonel A. B. Barber, director of the Conference on Street and Highway Safety, reported that the seven technical committees will be ready to submit final drafts of their reports the latter part of September or early in October.

George M. Graham, chairman of the committee, visualized the work of the committee to be the bringing together of all the public elements in the communities throughout the United States and showing them how the results of the General Conference should be applied. To accomplish this he said he thought the committee might very well undertake to set up ideal procedures for towns and cities of various classes.

In other words, the scope of the work of the Committee on Public Relations is understood to be a study of the accident prevention programs of the organizations which have joined in the movement with a view of coordinating them into a general national program and to study the results of the work of the other committees.

Ford Will Supply Coal to Parts of Northwest

DETROIT, Aug. 13—Sale of coal from the Ford mines will be entered into by the Ford Motor Co. in the Duluth and northwest district with the establishment of its new lake freighters in regular service between the River Rouge foundries and the iron and timber properties in the northern peninsula. The principal purpose in entering the coal market in the Northwest is to provide full cargoes for the freighters both ways.

The freighters will carry 50,000 tons of coal monthly. Part of this will be delivered for use at the Ford properties in Michigan, the bulk, however, being delivered at Duluth.

Convention of M. A. M. A. Will Be Held Oct. 15-17

NEW YORK, Aug. 14—The dates of the fall convention of the Motor and Accessory Manufacturers' Association have been advanced a week, Oct. 15, 16 and 17 having been selected. The convention will be held in Cleveland. E. P. Chalfant, chairman of the board of the Gill Manufacturing Co., has been appointed chairman of the committee to handle the affair.

MEN OF THE INDUSTRY

Handley Joins Distributor

James I. Handley, organizer of the Handley-Knight Co. and president of that concern during its brief manufacturing career, is returning to the retail field. He has become associated with the Simons Sales Co., former Willys-Overland distributor in Detroit, which is moving to Brooklyn, where it will handle the Maxwell and Chrysler. In 1907 Mr. Handley sold the Maxwell-Briscoe in Dallas, Tex., later becoming vice-president of the United States Motor Co. and resigning in 1911 to associate himself with John N. Willys in the Marion Motor Co. Later he was identified with the Willys-Overland Co. for six years, prior to forming the Handley-Knight company.

Farley Sails for Europe

J. I. Farley, president of the Auburn Automobile Co., has sailed for Europe to visit Auburn distributors there and to investigate business conditions on the Continent and England. He expects to be gone a month.

Schaeffer Resigns Managership

I. F. Schaeffer has resigned as vice-president and general manager of the Roamer Motor Car Co. His future plans have not been announced.

Weed Directs Commerce Sales

Julian C. Weed has been named director of sales of the Commerce Motor Truck Co. Mr. Weed is well known in the industry through his connection with the *Commercial Car Journal* in the Detroit territory.

Stanley C. Wilson Resigns

Stanley C. Wilson has severed his connection with the J. C. Wilson Co., manufacturer of Wilson trucks. He was secretary-treasurer and general manager of the company. Mr. Wilson has not announced his plans for new activity.

Landis Tool Promotes Nevin

W. G. Nevin has been appointed sales manager of the Landis Tool Co., Waynesboro, Pa., succeeding T. H. King. Mr. Nevin has been actively connected with the Landis company for 22 years, the last 12 of which have been with the sales department. Of late he has been engaged in special sales engineering work.

Harry Tipper Back from England

Harry Tipper, secretary of the Class Journal Co., has returned from England following the closing of the convention of the Associated Advertising Clubs of the World, which he attended as chairman of the general program committee. Mr. Tipper reports that the removal of the McKenna duties will not benefit American-made cars to the extent antici-

pated because of other conditions which tend to minimize the advantage of tax removal. The Englishman, he says, is forced to buy small-engined cars because of the heavy taxes imposed on a horsepower basis, as well as the high cost of gasoline, which makes fuel consumption a matter of great importance to the average Britisher.

Poertner Handles Master Bodies

William C. Poertner, for years one of the most prominent of the Metropolitan dealers, has returned to the industry after several months of retirement, taking on, through the Poertner Motor Car Co., of which he is president, the New York distributorship for Master bodies for Ford cars, made by the Ohio Body Co. of Cleveland.

Raskob Returns from Abroad

John J. Raskob, chairman of the Finance Committee of General Motors, returned on the Majestic this week, declaring that the settlement of the Dawes plan "will enable us to turn some of our dormant gold back into the channels of commerce by sending it abroad."

Sayres Manages Branch

E. F. Sayres, formerly assistant to the president of the Garford Motor Truck Co. at Lima, Ohio, has been appointed successor to R. L. Dean as manager of the company's branch in Los Angeles.

Willys-Knight Lists \$30 to \$100 Higher

Smaller Advance Applies Only to Coupe, Larger Covers All Other Models

TOLEDO, Aug. 15—All models of Willys-Knight cars are advanced \$100 in price, with the exception of the coupe, which lists \$30 above the former price, it was announced today by Willys-Overland, Inc.

The following tables show the old and new schedule:

MODEL "64"

| | Old Price | New Price |
|------------------------------|-----------|-----------|
| 2-pass. roadster | \$1,175 | \$1,275 |
| 5-pass. phaeton | 1,195 | 1,295 |
| 3-pass. coupe | 1,740 | 1,770 |
| 5-pass. standard sedan | 1,695 | 1,795 |
| 4-pass. coupe sedan | 1,450 | 1,550 |
| 5-pass. coupe sedan | 1,550 | 1,650 |
| 5-pass. sedan de luxe .. | 1,895 | 1,995 |

MODEL "67"

| | | |
|-----------------------|---------|---------|
| 7-pass. phaeton | \$1,325 | \$1,425 |
| 7-pass. sedan | 1,995 | 2,095 |

G. M. C. DECLARES DIVIDENDS

NEW YORK, Aug. 14—Directors of General Motors at their meeting today declared the regular quarterly dividends on all three stocks.

N. A. C. C. Places July Production at 258,200 Cars and Trucks, Representing an Increase of 5.3 Per Cent Over June

NEW YORK, Aug. 14—Estimates of July production, based on shipping returns, made by the National Automobile Chamber of Commerce, show an increase of 5.3 per cent over June. Figures for the month just ended report production of 258,200 cars and trucks, as compared with 244,863 in July of last year.

The following table gives the statistics for the first seven months of 1923 and 1924:

| | Output | | Carloads | | Driveaways | | Boat | |
|----------------|---------|---------|----------|--------|------------|--------|-------|--------|
| | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 |
| January | 316,278 | 243,554 | 46,559 | 35,223 | 40,976 | 30,031 | 1,018 | 728 |
| February | 367,527 | 276,955 | 49,219 | 36,165 | 48,300 | 43,613 | 1,100 | 882 |
| March | 382,474 | 355,073 | 54,286 | 44,983 | 41,545 | 62,988 | 500 | 1,908 |
| April | 373,201 | 382,746 | 49,400 | 46,095 | 36,623 | 60,467 | 4,056 | 5,027 |
| May | 312,858 | 394,190 | 35,400 | 45,095 | 32,700 | 62,346 | 8,295 | 12,812 |
| June | 245,790 | 378,575 | 25,988 | 40,281 | 25,142 | 59,099 | 7,300 | 13,492 |
| July | 258,200 | 328,063 | 28,055 | 32,623 | 26,090 | 46,837 | 7,500 | 10,131 |

Factory shipments and output for the other months of 1923 and 1922 follow:

| | Output | | Carloads | | Driveaways | | Boat | |
|---------------|---------|---------|----------|--------|------------|--------|--------|--------|
| | 1923 | 1922 | 1923 | 1922 | 1923 | 1922 | 1923 | 1922 |
| August | 345,271 | 274,209 | 38,319 | 32,817 | 45,958 | 36,768 | 10,053 | 10,104 |
| September .. | 327,506 | 207,206 | 35,986 | 26,335 | 39,653 | 30,177 | 8,463 | 8,118 |
| October | 365,162 | 239,406 | 42,236 | 27,100 | 37,947 | 35,203 | 7,663 | 7,606 |
| November .. | 312,996 | 237,329 | 38,133 | 27,232 | 32,959 | 27,376 | 6,413 | 5,070 |
| December .. | 303,201 | 228,410 | 34,984 | 27,244 | 27,608 | 26,743 | 4,000 | 1,307 |

Motor vehicle production segregated as to cars and trucks is as follows:

| | 1923 | | | 1923 | |
|----------------|---------|--------|----------------|---------|--------|
| | Cars | Trucks | | Cars | Trucks |
| January | 223,822 | 19,732 | December | 275,472 | 27,762 |
| February | 254,782 | 22,173 | | | |
| March | 319,789 | 35,284 | | | |
| April | 344,661 | 38,085 | | | |
| May | 350,460 | 43,730 | January | 287,353 | 28,925 |
| June | 337,442 | 41,173 | February | 336,374 | 31,153 |
| July | 297,413 | 30,692 | March | 348,356 | 34,118 |
| August | 314,431 | 30,872 | April | 337,045 | 36,156 |
| September .. | 298,964 | 28,578 | May | 279,447 | 33,411 |
| October | 335,041 | 30,139 | June | 217,927 | 27,863 |
| November .. | 284,939 | 28,073 | *July | 233,200 | 25,000 |

*Estimated.

Automotive Exports Reach High Figure

In Twelve Month Period, 199,135
Motor Vehicles Were Shipped
from the U. S.

WASHINGTON, Aug. 11—A total of 380,016 motor vehicles were exported in the fiscal year ending June 30, 1924, according to figures compiled by the Automotive Division of the Department of Commerce, thus creating a record that excels anything in the past by a large margin.

Of this total 199,135 were shipped from the United States, 67,624 were cars and trucks shipped from Canada by American companies maintaining plants in the Dominion, while 113,257 were foreign assemblies of American cars and trucks, which includes the products of such companies as Ford, Chevrolet and Overland.

Great Increase Shown

Considering the actual shipments of 199,135 from the United States, a comparison with past years shows that within a single decade annual exports of United States made motor vehicles have increased about 500 per cent, 1913-1914 recording only 37,198. The previous high, beaten by the 199,135, is 178,534 in 1919-1920, the year following the war.

On the basis of production of 3,980,443 in 1923-1924, the percentage of exports to production was 9.8 per cent.

Passenger cars constituted the bulk of foreign shipments from the United States during the fiscal period ending June 30, 1924, there being 142,395 shipped. Trucks shipped totaled 27,851 and motorcycles 19,736, while 174 electrics were shipped to foreign countries, and 7676 cars and 1303 trucks were sent to non-contiguous territories.

Shipments from Canada in the recent fiscal period included 52,149 cars and 15,475 trucks.

Not Equal to Boom Period

Although the automotive exports last year were much in excess of any previous 12-month period in numbers, they did not equal the post-war boom period in value, due to the higher prices commanded during the earlier years. The total value of these exports last year was \$211,843,129, compared with \$248,217,158 in 1919-1920, \$216,349,285 in 1920-1921, and \$36,856,073 in 1913-1914. In this respect, however, the correct measure of demand for making comparisons is that of number of units.

In shipments of parts, accessories, unit assemblies and service appliances, the past period set a new record, these exports being valued at \$77,249,053, as compared with \$66,292,652 in 1919-1920 and \$67,409,570 in 1920-1921. Since prices in these classes have fallen commensurately, the higher total value of these shipments indicates that the increase in volume has been remarkable. A large

"TRANSIENT" TRAFFIC MOUNTS IN NEW YORK

NEW YORK, Aug. 11—Vehicular traffic into and out of Manhattan has increased more than 25 per cent since 1920, according to statistics compiled by the authorities.

A count taken on May 28 last at 28 points of entry shows that almost 200,000 vehicles entered or left by way of the ferries and bridges on that day, of which only 8 per cent were horse-drawn.

Figures compiled in 1920 report a total of 154,700 motor vehicles alone using the ferries and bridges daily.

part of the total amount is represented in parts of vehicles to be assembled abroad.

Australia and Japan were the two leading markets, respectively, for motor vehicles shipped from the United States in 1923-1924, standing far in advance of the others. Australia took 36,551, valued at \$26,311,456, including 2306 trucks, valued at \$2,783,184, while Japan bought 7254 trucks, valued at \$4,363,455, the big demand having been occasioned by the earthquake. Argentina received 10,321 units, valued at \$7,354,179; Canada 9381, valued at \$8,691,113; British South Africa 7045, valued at \$5,888,629, and Mexico 7021, valued at \$3,893,113.

These figures do not take into account the foreign assemblies which, for instance, in Argentina, approximated 20,000 during the period.

Kysor Company Formed to Produce Car Heater

DETROIT, Aug. 12—Kysor Heating Co. has been formed at Allegan, Mich., by Walter A. Kysor, formerly president and general manager of the Acme Motor Truck Co. of Cadillac, Mich. The company will manufacture and place on the market immediately a new type of heater for automotive vehicles, the feature of which is that it heats fresh air from the outside and forces it through the car.

The heater will be sold through the established accessory dealers of the country, the sales agency handling the product being located in Detroit.

New Limousine Type Body Built for Foreign Trade

INDIANAPOLIS, Aug. 11—The Mills-paugh & Irish Corp. of this city has started production on a limousine type body for foreign trade. It will be used with the Dodge Brothers No. 3 chassis. The local company also is manufacturing taxicab bodies for export and reports active markets in South America, Canada, Hawaii, the Philippines, Japan and Australia.

Akron Now Produces 80,000 Tires Daily

Faces Unprecedented Summer Demand—Rush Regarded as Not
Wholly Beneficial

AKRON, Aug. 13—Despite the general belief that the material increase in automobile tire business which was started two weeks ago will not last more than 60 days, some of the more important tire manufacturing companies continue to add men as rapidly as they can be obtained.

It is reported that one of the largest producers expects to add at least 2000 men during the next two weeks. The same company is reported to be planning an increase in wages for some of the more experienced tire men in an effort to prevent their going to competitors both in and out of Akron.

It is estimated that the daily production of tires at the present time is about 80,000 and that before the present flurry is over production may reach 85,000.

That this unprecedented summer business is not wholly beneficial is the opinion of some of the most important manufacturers. These leaders state that the cost of placing the plants in condition to take care of the large volume of business, including the hiring and breaking in of additional labor, is so large that the business does not produce the same volume of profit as during the regular production seasons.

These manufacturers now admit that it was a mistake to reduce tire production a month early as was the case last spring. Had production been maintained until the usual time at the regular figure the present rush with its accompanying costs would have been avoided, these makers say.

Fewer Associate Dealers Urged by Show Managers

ATLANTIC CITY, N. J., Aug. 11—Managers of more than 20 automobile dealers' associations from large distribution centers who were in convention here last week reported steady though slight improvement in business conditions in their territories, and forecast good business in the fall and in 1925. The association men were attending the annual summer meeting of the National Association of Automobile Show and Association Managers.

Sentiment of the meeting was strongly in favor of cutting down the number of associate, or community, dealers' in cities. The managers generally reported that distributors and dealers in their territories were operating on restricted profits because of over-population of the dealer field.

The show men generally approved the decision to open the New York and Chicago shows with two days of exclusive trade attendance.

South Africa Plans Industrial Growth

It May Include Taxing Body Imports, Although Such Is Not Likely for Some Time

JOHANNESBURG, SOUTH AFRICA, July 14 (by mail)—The General Election in South Africa has resulted in the Nationalists and the Labor Party obtaining a substantial majority over the South African Party, and the country is settling down again after the excitement. It was prophesied in the towns that if the Nationalists got in it would be bad for business, and a particularly virulent newspaper campaign was run in an endeavor to keep the South African Party in power. But in spite of the fact that the S. A. P. had practically the whole of the English-speaking press in its favor—and the great majority of the available motor transport on election day—they lost heavily.

Slump Has Not Come

The threatened slump in business has not come. Instead, there is a somewhat healthy outlook, and people are looking forward to the industrial expansion promised by the new Government. This policy of expansion might lead to a tax on all motor-car bodies brought into South Africa, although this is not likely to happen for some time. It is the opinion of many, however, that taxation on the Australian scale might develop a large body-building industry here. As regards car sales at present, the position is good, much better than was forecast before the election.

Flying hordes of locusts have invaded the whole of South Africa south of the Zambesi, and a serious menace to farming has developed. New cotton lands that were being exploited in the Northern Transvaal have suffered very severely and many of the farmers are faced with ruin. The position is being thoroughly investigated by the new Government and an expedition has been sent to the Kalahari Desert, that vast waste of sand and scrub to the west of Kimberley and Bechuanaland. It is in this, the second largest desert in the world, that the locust swarms are breeding, and it will be a mighty difficult proposition to annihilate them. However, everyone is hoping for the best, and the work of extermination is going on in the Union of South Africa and Rhodesia.

Farmer Purchases Affected

This has naturally affected business and the farmers will not buy quite as many cars as anticipated. In spite of everything, however, the position cannot be called bad.

The latest car arrivals are the Oldsmobile Super-special model, the big Berliet four, a French car, and the V-63

DEALERS CONSIDERING WEEKLY COLLECTIONS

PHILADELPHIA, Aug. 13—Under a plan now being considered by automobile dealers here, collections from purchasers of cars on time payments would be made weekly instead of monthly, the idea being to "get your money while they have it." As from 75 to 80 per cent of the cars sold in Philadelphia are time transactions, delays in payments constitute a serious drawback to the trade.

The plan, it is felt, would result in fewer replevin proceedings on the part of the financing parties and would permit dealers to be more prompt in meeting their obligations.

Some truck and bus dealers have adopted the weekly plan of collections with excellent results.

Cadillac. It is stated that the Franklin agency has been taken up again in this town and that the new models are on their way out from the factory. The Franklin has a good name here, but the objection to it is the left-hand drive, which is incorrect for traffic which has to keep to the left. Another car that the country looks forward to seeing shortly, and it is understood it is on the way to Johannesburg, is the new Chrysler Six. The factory representative, C. C. De Vore, is at present in South Africa.

There is an evident move on the part of the motor industry to open up Rhodesia more, but it has been pointed out that there is a comparatively small white population and that the proportion

(Continued on page 348)

Central Gear Prepares for Greater Production

INDIANAPOLIS, Aug. 13—The Central Gear & Manufacturing Co., formerly the Automatic Gear Blank Co., has been reorganized following the change of name. The capital has been doubled and new machinery installed to permit of an increased output of screw machinery products, spur and helical gears, as well as brass and fiber gears.

Charles Drexler, president of the company is in charge of production. Other officers include Charles Retherford, vice-president, and W. Carleton Starkey, at one time general manager of the Stevenson Gear Co., secretary-treasurer. C. William Whaley is chairman of the board.

ALFA-ROMEO TO BE SOLD HERE

NEW YORK, Aug. 11—Rinaldo Stroppa-Quaglia has opened headquarters at 383 Madison Avenue, this city, for the Alfa-Romeo car, which recently won the European Grand Prix. It is his intention to place agencies throughout the country for this Italian car.

More Gasoline Data Requested by Stone

Report of Federal Trade Commission Said to Be Incomplete in Some Ways

WASHINGTON, Aug. 12—Attorney-General H. F. Stone has ordered a further inquiry into the gasoline price situation. The report of the Federal Trade Commission on the subject, made at the request of the President, contains information, Mr. Stone discloses here, which warrants a further investigation of the several phases of the problem.

Department officials described the Commission's report, which has never been made public, as "very interesting," but indicated that it was incomplete in some ways, and the Department of Justice will now delve into the leads thus afforded.

Mr. Stone was said to believe that such an inquiry might supply the Government not only with a better knowledge of what is going on in the whole oil industry, but with evidence which it might use in its injunction suits recently filed in Chicago to break up selling agreements based upon use of the so-called cracking process in the industry.

Pennsylvania Railroad Doubles Truck Service

NEW YORK, Aug. 11—The Pennsylvania Railroad has doubled its truck service within the last few months and now is operating 20 motor truck units in replacement of local freight trains which previously were operated to carry less-than-carload freight. This involves the use of about 40 trucks. In addition the Pennsylvania has expanded its routes until now its truck service is covering 1412 miles, as compared with 602 last spring.

The State of New Jersey now is completely motorized insofar as the hauling of l.c.l. freight by trucks by the Pennsylvania is concerned.

It is the plan of the Pennsylvania to use trucks later on for terminal interchange of l.c.l. freight in large cities and eventually to expand its movement by trucks between stations and terminals into a store-door delivery and collection service.

FOUR WITH COMPANY 46 YEARS

BOSTON, Aug. 11—The John L. Whiting-J. J. Adams Co., brush manufacturer, has taken out group life insurance for its employees, which brings out the fact that 18 of them have been with the company more than 40 years, four having been on the payroll for 46 years. In addition 12 have been with the company 35 years, eight 30, and 15, 25. In all, 53 have worked for the company more than a quarter of a century.

Olds Line Featured by New Body Models

**Duco Finish Is Used—Revision
of Prices Upward Ranges
from \$60 to \$115**

LANSING, MICH., Aug. 14—New body models and Duco finish on all models are the features of the Oldsmobile line for 1925. Prices have been revised upward by amounts ranging from \$60 to \$115. With the exception of minor changes in the engine and chassis, the car is continued without change.

The most striking changes are in the design of the radiator shell and hood. The former is nicked and has a double curve at the top with a slightly curved downward peak in the center, which serves as a base for the Oldsmobile emblem. The sides of the shell are slightly concaved and the width at the base is a little greater than at the top. The shell is somewhat higher, which makes possible an almost level streamline hood. The hood follows the double curve of the top of the radiator shell. Bell-shaped head and cowl lights, designed to harmonize with the new radiator lines, are standard on all models. They are of a heavier and more substantial construction than were the drum type used formerly.

Finish on Standard Models

The standard models are finished in Oldsmobile blue with ivory striping on body and wheels. The use of a weathered bronze-green on the sport models is continued, the striping being black and gold. Duco is used not only on the bodies of all models, but also on the upper sections on the closed jobs. The standard open models are upholstered in black Fabrikoid, and the open sport models in heavily grained brown Spanish type material. The closed models, all of which are equipped with metal sun visors covered with black Fabrikoid, are upholstered in a brown-taupe shade of striped velour. All closed bodies are by Fisher.

The instruments are now grouped in a nickel rimmed oval in the center of the board. The speedometer and the ignition and light controls are both inclosed in miniature reproductions of the new radiator design. Gearshift and hand brake levers are nicked on all models. In the sport and deluxe models, a gasoline gage is included in the instrument group, the steering column is nicked and the steering wheel has an aluminum spider. On the sport open models, the instrument board is of white nicked metal protected by lacquer.

Tappets of Cast Iron

In the engine the tappets are now of chilled cast iron instead of steel, and the split wrist pin bushings have been replaced with the solid type, both of these changes having been made to secure longer life. A check valve has been

placed in the lubrication system to insure the oil pump being primed under all conditions, and the suction pipe has been placed so that it will catch oil even when the car is at a considerable angle. Solid rubber bumpers are placed over both front and rear axles to reduce strains on the springs caused by heavy road shocks.

The new price schedule follows:

| | Old Price | New Price |
|--------------------------------|-----------|-----------|
| 2-passenger roadster..... | \$ 785 | \$ 875 |
| 2-passenger special roadster.. | 885 | 985 |
| 5-passenger phaeton..... | 795 | 875 |
| 5-passenger special phaeton.. | 915 | 1015 |
| 2-passenger business coupe... | 985 | 1045 |
| 4-passenger coupe..... | 1075 | 1175 |
| 5-passenger sedan..... | 1135 | 1250 |
| 5-passenger de luxe sedan... | 1245 | 1350 |

Hayes Manufacturing Co. Petitions to Be Dissolved

DETROIT, Aug. 11—Voluntary dissolution of the Hayes Manufacturing Co. is sought by the board of directors with authorization of their stockholders. A petition to that effect has been filed in Circuit Court here, and temporary receivers have been appointed. An order to show cause why permanent receivers should not be named is returnable Sept. 30.

The Hayes Manufacturing Co. is one of the larger manufacturers of sheet metal parts and stampings for the industry. The company has been affected by the inability of its car manufacturing customers to take shipments in quantities adequate to permit of profitable operation of the plant. In the petition asking for dissolution of the company it is set forth that the volume of metal business is rapidly diminishing and that there is not sufficient business in sight to operate at a profit. Permission to operate until raw materials on hand have been utilized applies.

The petition for dissolution is signed by Frank Blair, James H. Flynn, Herbert Carrow and LaClanche Meon, all members of the directorate, who submit that they are acting upon the authority of the shareholders who convened June 22 to consider liquidation proceedings. Mr. Carrow, Mr. Meon and the Union Trust Co. of Detroit are named temporary receivers.

Detroit Sales Increase in Medium Priced Lines

DETROIT, Aug. 13—Sales of new cars at retail in Detroit during July totaled 5889, an increase from 5746 in June and a gain from the 5617 set up in July last year. Truck sales during the month were 441, a falling off from the 493 in June and from the 526 in July, last year.

Most of the gain in July was in the medium priced lines, several of which introduced new models on July 1. Ford car business during the month reached 2780, or 47 per cent of the total, which is a reduction from June, when Ford sales were 51 per cent.

FINANCIAL NOTES

Hayes Wheel Co.'s report for the first half of the year shows net profit of \$416,230 after interest, etc., which compares with \$787,526 in the corresponding period last year. Current assets as of June 30 were \$5,538,167, including \$1,267,838 cash, against current liabilities of \$1,342,357. The company states that the operating results of the second quarter reflected the depressed condition of the industry during that period. There has been a pickup since, July being 23 per cent better than June.

Durant Motors of Canada, Ltd., announces that its shares now are exchangeable for shares of Durant Motors, Inc., the parent company. The outstanding capital stock of the Canadian company consisted of 300,000 shares of \$10 par value. The shares were sold in series A, B and C at \$10, \$12 and \$15 per share, respectively. The exchange is on the basis of \$30 per share. American funds for Durant of Delaware, or three shares of A, two and one-half shares of B or two shares of C.

Martin Parry Corp. for the quarter ended June 30 reports net profits of \$122,661 after interest, taxes, etc., equivalent to \$1.22 a share earned on 100,000 shares of no par stock outstanding. This compares with \$1.39 a share earned in the preceding quarter. Net profits for the six months ended June 30 were \$262,368 or \$2.62 a share.

Yellow Cab Manufacturing Co. for the second quarter reports net profit of \$795,458, after taxes, etc., as compared with \$1,118,152 in the same period last year. This is equivalent to \$1.32 a share earned. The six months' net profit was \$1,800,480, or \$1 a share against \$2,062,586 in the first half in 1923.

Chicago Yellow Cab Co. at the end of the second quarter showed net profit of \$515,929 after depreciation, etc., as against \$537,176. This is equivalent to \$1.29 a share on 400,000 shares of no par capital stock. The six months' net profit was \$1,144,783 compared with \$1,040,499.

Miller Rubber Co. has declared the regular quarterly dividend of 2 per cent and 1 per cent on account of accumulations on the preferred stock. The company paid 1 per cent on account of accumulations on the preferred on June 1.

Curtiss Aeroplane & Motor Corp. has declared only the regular semi-annual cumulative dividend of 2½ per cent on the preferred stock, payable Sept. 2 to stock of record Aug. 15.

Timken Roller Bearing Co. has declared an extra dividend of 25 cents and the regular quarterly dividend of 75 cents, both payable Sept. 5 to stock of record Aug. 20.

Spicer Manufacturing Co. has notified holders of its 6 per cent gold notes, due Oct. 1, that it is ready to pay off these securities at once at par and interest.

Fifth Avenue Bus Securities Corp. voting trustees have issued a notice of termination of the voting trust.

F.W.D. FOREIGN TRADE

CLINTONVILLE, WIS., Aug. 13—Foreign business of the Four Wheel Drive Auto Co. is improving especially well, and inquiries as well as actual orders are increasing. The Hanyei Trading Co. of Tokio, distributor of the F. W. D. truck in Japan, has placed an order for 12 standard trucks within the last few weeks.

Larger Engine Used in Oakland Models

Improvements Are Also Made in Chassis and Landau Sedan Is Added to Line

DETROIT, Aug. 12—The Oakland Motor Car Co. is continuing its 6-54 line with a larger engine, improvements in chassis and bodies and the addition of a new body model called the landau sedan.

All models have 31 x 4.95 balloon tires as regular equipment, and the closed bodies have the new Fisher VV one-piece sliding windshield. Prices on all models have been increased \$100.

The piston displacement of the engine has been raised to 185 cu. in. by increasing the cylinder bore from 2 13/16 to 2 7/8 in., and this change, in conjunction with an increase in the rear axle reduction from 4.7 to 5 to 1, has greatly improved acceleration. The pistons are now of semi-steel with three plain 1/8 in. rings all above the pin.

Transmission Strengthened

The transmission has been strengthened by increasing the face width of the constant mesh and intermediate gears from 1 1/16 to 3/4 in. and the ten-spline 1 1/4 in. mainshaft used formerly has been replaced with a six-spline 1 7/16 in. shaft. An oil retainer has been added to the inside of the rear wheel roller bearing to prevent leakage at this point.

The construction at the rear brakes has been simplified by increasing the length of the brake band lever and curving it backward, which change eliminates two links formerly used at this point. In the front axle ball thrust bearings on the king pins have replaced the washers used previously on the open models, the number of leaves in the front springs has been increased and front snubbers are provided on the closed models to improve the riding qualities.

The driving compartment has been enlarged to give increased leg room. The appearance of the car from the front has been slightly changed by an increase in the length of the radiator shell and the elimination of the fender tie rod.

New Landau Sedan

The new landau sedan is finished in Buckingham gray Duco with red striping, nickel trimmings and black fenders. It has oval windows in the rear quarters and carriage irons. The upholstery is plush mohair to match the exterior finish.

Accessory equipment includes double-bar bumper in front, rear fender guards, nickel plated head and cowl lamps, dash gasoline gage, walnut moldings, Moto-Meter with nickeled wing cap, kick plates, rubber runningboard mats, nickeled door handles, silk roller shades, dome light, heater and door locks. On the special touring and roadster models, fender guards have replaced the full width rear bumper furnished formerly. These mod-

els are finished in Oakland blue with black striping.

The closed models all have a new design of visor and an automatic windshield cleaner with control on the dash. The springing in the back and seat cushions of these models has also been improved. Standard bodies are finished in Holland blue with white striping body and wheels.

The new price schedule follows: Chassis, \$925; phaeton, \$1,095; roadster, \$1,095; special phaeton, \$1,195; special roadster, \$1,195; landau coupe, \$1,295; four-passenger coupe, 1,495; sedan \$1,545, and landau sedan, \$1,645.

INDUSTRIAL NOTES

Universal Auto Cover Co., Boston, will hereafter be known as the Auto Spring Protector Co. There has been no change in personnel, and the company, which is located at 330 Newbury Street, that city, will manufacture slip covers, tire covers and hood and radiator covers, with its spring protector as the leader of its line.

Stutz Motor Car Co. of America has bought additional property in Indianapolis which will give it control of the entire block upon which the major part of the plant stands. Additions to the factory will be erected on the newly acquired land.

General Tire & Rubber Co. will erect a new wing to its present plant in Akron to take care of increasing demand. The addition will permit the company to bring daily production to more than 6000 tires.

Deluxe Coupe and Sedan Added to Chevrolet Line

DETROIT, Aug. 12—The Chevrolet Motor Co. has added a deluxe coupe and sedan model to its line, priced at \$775 and \$940 respectively. Both are finished in gray Duco with a wax polish finish below the belt and black above with nickel trimmings.

The accessory equipment regularly furnished with these models consists of front and rear bumpers, nickel radiator, Moto-Meter and lock, corrugated rubber covered runningboards, kick plates, disk wheels and wheel lock, oversize cord tires, plush mohair upholstery, cowl lamps, rear view mirror, adjustable visor and windshield wiper.

Overland Lowers Plant Inventory \$11,000,000

TOLEDO, Aug. 12—John N. Willys, following retail sales of 18,000 cars in July by the Willys-Overland Co., declares dealer stocks now are down to a normal basis and factory orders again increasing. He says dealer stocks have been reduced more than 30,000 cars in the last 90 days, and factory inventory cut \$11,000,000. Factory current liabilities were reduced \$15,000,000 in the second quarter.

Mr. Willys also declares that his company has reduced its funded debt \$1,000,000, and that it has no bank indebtedness.

METAL MARKETS

Recent downward revision of the full-finished automobile sheet quotation was rather in the nature of harmonizing the price for that specialty with the prices current for other sheets than because of weak spots in the automobile sheet situation. The present market for black, blue and galvanized sheets is \$2 to \$4 lower than it was early in July. The leading interest's reduction of the price of full-finished automobile sheets from 5.10c. to 5.00c. is equivalent to the \$2 per ton decline which has taken place in the last month in the price of blue annealed sheets. The fact that the largest manufacturer of low-priced passenger motor cars has been able to place a large order at 4.75c. has, in the opinion of some, justified quoting a range of 4.75 to 5.00c.

It is an open question, however, whether this range is really representative of the general market. This particular buyer, even in times when capacity has been engaged to the fullest extent, has been able to obtain concessions of \$3 to \$5 a ton, largely because of the desirability of specifications. If some of the mills are now disposed to meet this cut, it is in the hope of bringing out orders that in tonnage and specifications will prove just as attractive as the purchase referred to. The steel industry finds itself in the twilight zone, with the worst generally admitted to be over and gradual improvement not far off—in the opinion of some, right around the corner.

Such a condition offers unquestionably opportunities to the purchasing agent who knows how to take advantage of the producer's eagerness to set wheels turning on a broader scale. Non-integrated sheet rollers are again bringing pressure to bear upon the sheet bar market, and transactions at \$38, instead of the \$40 price heretofore in vogue, would not come as a surprise. The better showing made in the chief interest's unfilled tonnage statement for July accentuates faith in the gradual uptrend of the demand. Liquidation has run its course in orderly fashion, and steel consumers would do well to consider that with the normal quickening of activities that may be looked for in September, the volume of demand is certain to expand. This does not necessarily portend immediate advances, but the ragged market conditions of the present are certain to give way to a gradual hardening of prices.

Pig Iron.—Sales consist largely of small lots, but some of the larger automotive foundries are negotiating for fourth quarter shipments, or at least sounding blast furnace representatives as to prices.

Aluminum.—Seasonable quiet is noted in the domestic market, and prices are generally unchanged. Recent discussion between German consumers and producers of aluminum sheets elicited the information that prices in that country are 53 per cent above June, 1914, quotations. Consumers contend that quotations for ingots as well as sheets and circles are too high and will have to come down, if the German aluminum industry is to live.

Copper.—Domestic consuming demand is principally for deferred maturities. As usual, the copper market is attracting much closer attention from consumers since the advance has set in. Connecticut Valley rolling mills report fair orders from the automotive industries.

Zinc.—Consumers show little interest. Market easy.

Calendar

SHOWS

- Oct. 21-27—Transportation Show, Motor Truck Industries, Inc., American Exposition Palace, Chicago.
- Nov. 9-15—New York, Annual Automobile Salon, Commodore Hotel.
- Nov. 10-15—Chicago, Annual Show and Convention of the Automotive Equipment Association, Coliseum.
- Jan. 2-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory. Trade attendance only, Jan. 2-3.
- Jan. 23-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory. Trade attendance only, Jan. 23-24.
- Jan. 25-31—Chicago, Annual Automobile Salon.
- FOREIGN SHOWS**
- Aug. 23-Sept. 2—Bratislava, Slovakia, International Danube Fair.

- Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.
- September—Vienna, Austria, Vienna International Fair.
- Sept. 13—Sao Paulo, Brazil, Annual Automobile Show.
- Sept. 21-28—Prague, Czechoslovakia, Prague Autumn Fair.
- Oct. 2-5—Danzig, Second International Danzig Fair, automobiles and allied equipment.
- Oct. 2-12—Paris, passenger cars, motor cycles, bicycles and accessories, Grand Palais.
- Oct. 17-25—London, Annual Passenger Car Show, Olympia.
- Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.
- Nov. 9-19—Buenos Aires, Annual Automobile Show, Pabellon de las Rosas, under the auspices of the Automovil Club Argentino.

- Dec. 1-13—Montevideo, Uruguay—Second Annual Motor Show, under the auspices of the Centro Automovilista del Uruguay, held in buildings of the Asociacion Rural del Uruguay.

RACES

- Sept. 1—Altoona.
- Sept. 1—Syracuse.
- Sept. 7—Monza Track, near Milan, Italy, Italian Grand Prix.
- Oct. 2-4—Dayton, Ohio, Fifth Airplane Race for the Pulitzer Trophy.
- Oct. 4—Fresno.
- Oct. 19—Kansas City.
- Nov. 24—Los Angeles.

CONVENTIONS

- Sept. 17-20—White Sulphur Springs, W. Va., Annual Meeting of the Automotive Electric Association, Greenbrier Hotel.
- Sept. 19-20—Niagara Falls, N. Y., National Battery Manufacturers Association.
- Sept. 22-26—Boston, Sixth Convention and International

Steel Exposition of the American Society for Steel Treating.

- Oct. 16-18—Briarcliff Manor, N. Y., Semi-Annual Meeting of the American Gear Manufacturers Association, Briarcliff Lodge.
- Jan. 5—New York, Convention under the auspices of the National Automobile Dealers Association, Hotel Commodore.
- Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

S. A. E. MEETINGS

- September—New York City, S. A. E. Automotive Transportation Meeting.
- Oct. 21-24—S. A. E. Production Meeting, Detroit.
- Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.
- Oct. 26—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.
- January—S. A. E. Annual Meeting, Detroit.

Farman Plane Stays in Air Record Time

PARIS, Aug. 5 (by mail)—By remaining in the air 37 hr. 59 min. 10 sec., a Farman commercial biplane, fitted with a Farman 12-cylinder 450-hp. engine, and piloted by Coupet and Drouhin, has established a new world's endurance record and has beaten the American record by rather more than 90 minutes.

Unsatisfactory weather conditions interfered with the performance and prevented the aviators securing all the records they had hoped to capture. Starting with 1120 gallons of gasoline and 230 gallons of oil, with which it was expected to be able to stay in the air 48 hours, the machine encountered heavy thunderstorms after 19 hours' flight, and was obliged to run before the gale from Chartres to the neighborhood of Orleans.

The engine, starting off with the full load of 6½ tons, was at first run at nearly its maximum of 1800 revolutions, giving 900 revolutions for the geared-down propeller, but as the load decreased it was throttled down and a flying speed of 65 m.p.h. was maintained. The test proved that at this speed the range of action was 3250 miles.

The record-breaking flight was made with the Farman biplane with which the world's endurance record was broken a year ago, but transformed to use a single engine. This is the Farman 12-cylinder W-type of 5.1 by 6.3 in. bore and stroke, having steel cylinders with welded jackets and four valves per cylinder operated by pushrods and rockers.

The Farman engineers attribute their success, in a very large measure, to their special type of reduction gear, which allowed a high-efficiency Chauviere propeller of 157 in. diameter to be made

use of. It is certain that with a direct drive propeller, the machine would never have been able to lift with a total weight of 6½ tons. The engine, which has been specially designed for economical commercial service, is entirely a Farman production.

Wing spread is 92 ft.; surface, 1830 sq. ft.; load per square meter, 83 lb.; gear reduction, 1 to 2.

Ford's Plants Embrace 8 Water Power Projects

DETROIT, Aug. 13—With the completion and start of operations of the Ford hydro-electric power house near Iron Mountain, Mich., the company now has completed or under construction eight water power developments in the United States with a total generator capacity of 50,040 h.p. These plants and their capacity are as follows:

| | H. P. |
|--------------------------|---------------|
| Twin Cities | 24,200 |
| Iron Mountain | 10,000 |
| Green Island, N. Y. | 9,650 |
| Hamilton, Ohio | 5,050 |
| Flat Rock, Mich. | 940 |
| Nankin Mills, Mich. | 80 |
| Phoenix, Mich. | 80 |
| Plymouth, Mich. | 40 |
| Total | 50,040 |

The Twin Cities project now under construction is to supply power to the new super-assembly plant now building at that point. Iron Mountain supplies power for the Ford woodworking mills, lumber projects and mines in that section. Green Island supplies power to the plant there manufacturing radiators, ring gears, springs and other products. The Hamilton plant makes wheels, Flat Rock lamps, and the plants at the smaller power house sites make numerous small parts and materials.

South Africa Plans Industrial Growth

(Continued from page 345)

of cars per capita is more than in the Union. Several trips have been made into Southern Rhodesia, among the longest being those by A. W. L. Ellis, factory representative for Studebaker, and W. Morgan, the B. F. Goodrich Rubber Co. (S. A.), Ltd.'s sales manager.

The motor exhibition at Durban, held from June 30 to July 5, in a large hall near the sea front, has been a great success. It was the first motor exhibition to be held apart from an agricultural show and this progressive step on the part of the dealers in Durban is likely to have far reaching consequences. The prime mover in the affair was G. McNicol of the firm of Wickins & McNicol, Buick and Cadillac distributor in Natal. Between 70 and 80 car models, besides motorcycles, tires and accessories, were on view, and the public had its first demonstration of an individual display by the industry.

Attempts have been made lately by motorists and motorcyclists to set new records for the road journey from Durban to Johannesburg, a distance of just over 400 miles. But the police and the provincial authorities in Natal and the Transvaal, backed up by those in the Orange Free State and the Cape Colony, have decided definitely to stop road racing. This does not apply to the organized yearly motorcycle marathon. The authorities have the backing of public opinion and it seems fairly certain that no other speed records will be put up for some time. The speed question in this country is a fairly serious one and people have got into the habit of driving fast even in the cities.